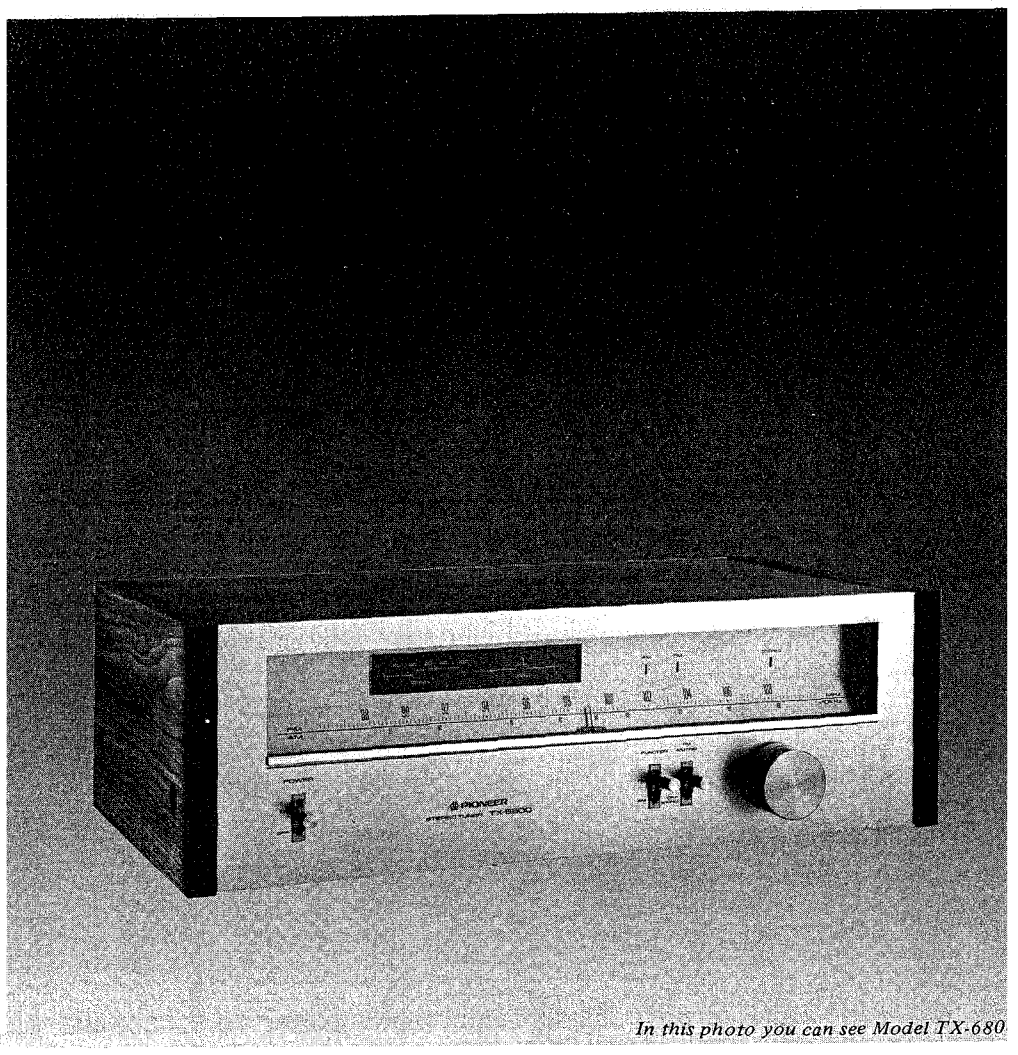


*In this photo you can see Model TX-680*

# *Service Manual*

AM/FM STEREO TUNER

# TX-6800
# TX-608

PIONEER®

Both Model TX-6800 and TX-608 have the same basic performance. The major difference is in appearance, Model TX-6800 being fitted with wooden side and top panels, while Model TX-608 employs metal.

MODEL TX-6800 COMES IN TWO VERSIONS DISTINGUISHED AS FOLLOWS.

| Type | Voltage | Remarks |
|---|---|---|
| KU | 120V only | U.S.A. model |
| KC | 120V only | Canada model |

MODEL TX-608 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS:

| Type | Voltage | Remarks |
|---|---|---|
| KU | 120V only | U.S.A. model |
| HE | 220V and 240V (Switchable) | Europe model |
| HB | 220V and 240V (Switchable) | United Kingdom model |
| HP | 220V and 240V (Switchable) | Oceania model |
| S | 110V, 120V, 220V and 240V (Switchable) | General export model |
| S/G | 110V, 120V, 220V and 240V (Switchable) | U.S. military model |

**This service manual is applicable to the TX-6800/KU. When repairing the TX-608/KU, please see page 23, and for the other types, please refer to the additional service manuals.**

# CONTENTS

# 1. SPECIFICATIONS

## Semiconductors

| | |
|---|---|
| ICs | 3 |
| FET | 1 |
| Transistors | 8 |
| Diodes | 15 |

## FM Section

| | | | |
|---|---|---|---|
| Usable Sensitivity | MONO: | 10.8dBf (1.9μV) | |
| 50dB Quieting Sensitivity | MONO: | 15dBf | |
| | STEREO: | 38dBf | |
| Signal-to-Noise Ratio at 65dBf | MONO: | 80dB | |
| | STEREO: | 74dB | |
| Distortion at 65dBf | MONO: | 100Hz | 0.1% |
| | | 1kHz | 0.1% |
| | | 6kHz | 0.15% |
| | STEREO: | 100Hz | 0.2% |
| | | 1kHz | 0.2% |
| | | 6kHz | 0.25% |
| Capture Ratio | | 1.0dB | |
| Alternate Channel Selectivity | | 60dB | |
| Stereo Separation | 1kHz: | 40dB | |
| | 30Hz to 15kHz: | 35dB | |
| Frequency Response | 20Hz to 15kHz $^{+0.5}_{-1.0}$ dB | | |
| Spurious Response Ratio | 70dB | | |
| Image Response Ratio | 60dB | | |
| IF Response Ratio | 80dB | | |
| AM Suppression Ratio | 55dB | | |
| Subcarrier Product Ratio | 50dB | | |
| Muting Threshold | 17.2dBf (4.0μV) | | |
| De-Emphasis Switch (Switchable) | 25μs - 75μs | | |
| Antenna Input | 300ohms balanced | | |
| | 75ohms unbalanced | | |

## AM Section

| | |
|---|---|
| Sensitivity | |
| IHF, ferrite antenna | 300μV/m |
| IHF, external antenna | 15μV |
| Selectivity | 35dB |
| Signal-to-Noise Ratio | 50dB |
| Image Response Ratio | 40dB |
| IF Response Ratio | 70dB |
| Antenna | Built-in Ferrite Antenna |

## Audio Section

| | |
|---|---|
| Output Level | 650mV/4.3kΩ (FM 100% MOD.) |

## Miscellaneous

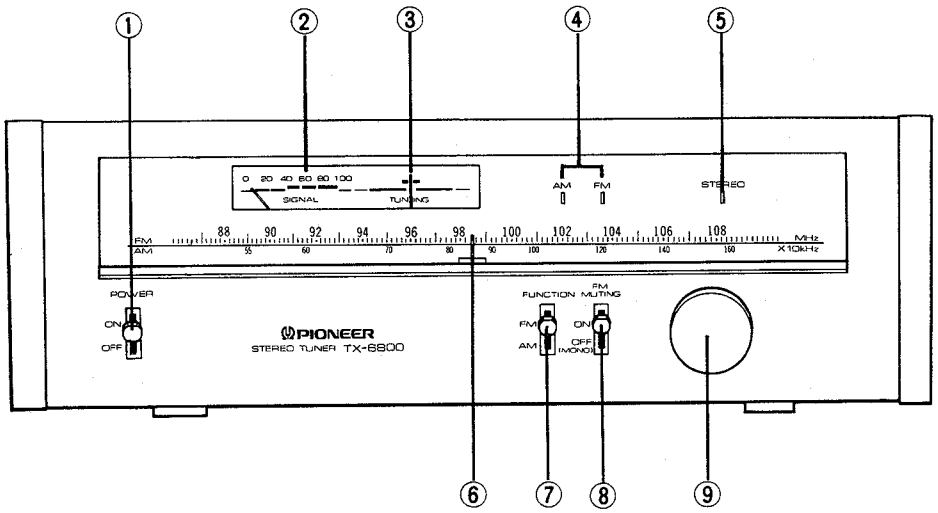
| | |
|---|---|
| Power Requirements | 120V 60Hz |
| Power Consumption | 14W |
| Dimensions | 451(W) x 151(H) x 284(D) mm<br>17-3/4(W) x 5-15/16(H) x 11-3/16(D) in |
| Weight (Without Package) | 5.3 kg (11lb 11oz) |

## Furnished Parts

| | |
|---|---|
| FM T-type Antenna | 1 |
| Connection Cord with Pin Plugs | 1 |
| Operating Instructions | 1 |

*NOTE:*
*Specifications and the design subject to possible modification without notice due to improvements.*

# 2. FRONT PANEL FACILITIES




### ① POWER SWITCH

Set this switch to ON to supply power to the tuner.

### ② SIGNAL METER

This meter indicates the antenna input level of the AM and FM broadcasting waves. The higher the input level, the more the meter deflects toward right. When selecting the desired station, find the position of the tuning knob which effects the maximum deflection of the meter pointer. When selecting an FM station, also observe the tuning meter to determine the optimum tuning point.

### ③ TUNING METER

This meter indicates the optimum tuning point irrespective of the field strength when selecting an FM station. With no signal, the pointer remains at the center; as a signal is tuned in, it deflects to the right or left; when the signal is tuned in accurately, the pointer will correctly move to the center of the scale. If the tuning knob is adjusted further, the pointer deflects to the right or left; as the signal moves off completely, the pointer returns to the center position again.

### ④ FUNCTION INDICATORS

These indicators light up during an FM or AM reception, respectively.

### ⑤ FM STEREO INDICATOR

This indicator lights up when the tuner is receiving a stereo program if the FM muting/mode switch is set to ON.

### ⑥ DIAL POINTER

This pointer indicates the broadcasting stations.

### ⑦ FUNCTION SWITCH

This switch is used to select the type of broadcasting waves.

FM ..... For reception of FM broadcasting
AM ..... For reception of AM broadcasting

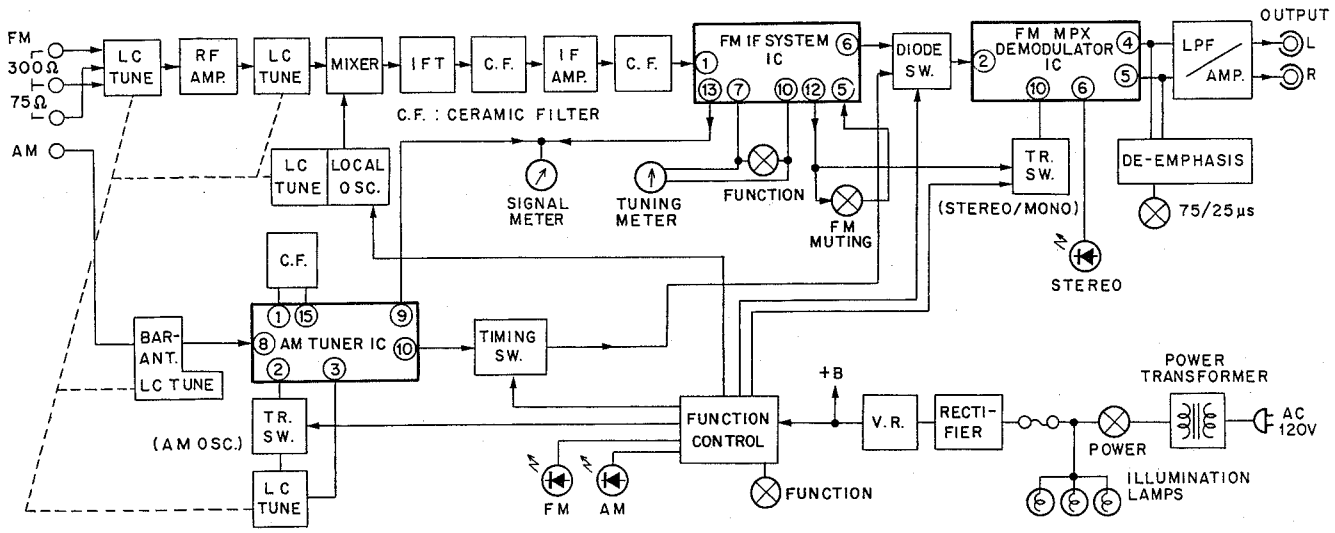
### ⑧ FM MUTING/MODE SWITCH

When this switch is set to ON, unpleasant interstation noise is eliminated, which makes selection of stations easier. However, if the muting switch is set to ON in areas where the field strength is extremely weak, the station being received may also disappear. In such areas, therefore, the muting switch should be turned OFF (MONO). When this switch is set to OFF (MONO), monaural reception will be obtained even though the station is broadcasting a stereo program.

### ⑨ TUNING KNOB

This knob is used for selecting station. When selecting an AM station, observe the signal meter, and when selecting an FM station, observe both the signal meter and the tuning meter.

# 3. BLOCK DIAGRAM




# 4. CIRCUIT DESCRIPTIONS

## 4.1 AM TUNER

The AM tuner employs a 2-ganged tuning capacitor, a single-element ceramic filter, and an IC (HA1138) consisting of an RF amplifier, mixer, 2-stage IF amplifier, detector and AGC amplifier. See Fig. 4-1 for the block diagram.

When the FUNCTION switch ($S_3$) is in the FM position, +B is applied to the emitter of $Q_{11}$ via $R_{52}$, $R_{62}$ and $R_{65}$. $Q_{11}$ will turn off, and the local oscillator circuit will be opened.

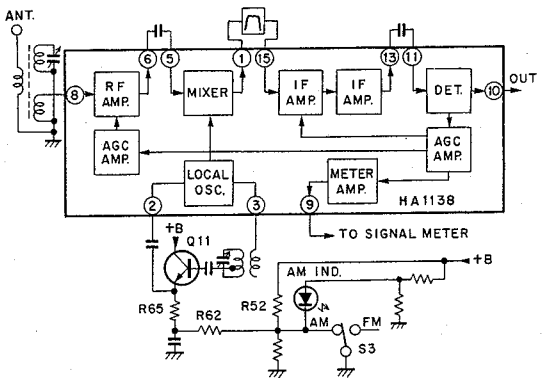



Fig. 4-1 AM tuner

## 4.2 FM TUNER

### Front-End

A frequency linear 3-gang variable capacitor is used with a single stage FET RF amplifier.

The FET possesses high input impedance compared with a transistor, and allows simple coupling with the input tuning circuit, plus a significant advantage in terms of noise.

The local oscillator, $Q_3$ employs a modified Clapp circuit, thereby reducing the amount of drift caused by changes in time, ambient temperature, and power supply voltage. Also since the oscillator signal is obtained from the tuning circuit, there are far fewer higher harmonics, resulting in a much cleaner waveform with less spurious interference.

The oscillator signal is applied to the base of the mixer transistor $Q_2$ via low capacity capacitor.

When the FUNCTION switch ($S_3$) is in the AM position, +B is applied to the cathode of $D_1$ via $R_{34}$. $D_1$ will be cut-off and $Q_3$ will turn off.

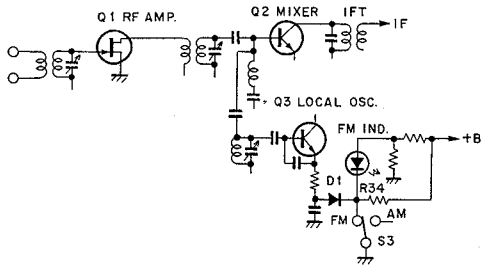



Fig. 4-2 FM front end

### IF Amplifier and Detector

This stage includes 2 dual-element ceramic filters, a transistor and an IC (PA3001-A) with a high SN ratio and very little distortion. The transistor inserted between the two ceramic filters is employed for impedance matching purposes as well as to increase the gain.

PA3001-A includes the IF limiter amplifier, FM detector (quadrature detector), AF amplifier, muting circuit and the meter drive circuit.

The muting circuit is turned on when pins 5 and 12 are connected by means of the FM MUTING switch. If the dial pointer is moved approx. ±70kHz away from a station, and the input level is very low (equivalent antenna input less than 4$\mu$V), a 5V DC signal is generated at pin 12, and applied to pin 5, thereby activating the muting circuit within the IC.

### FM MPX Stereo Demodulator

The IC (PA1001-A) employed in the FM multiplex stereo demodulator stage also features a high SN ratio and reduced distortion. Due to the incorporation of a pilot auto-canceller circuit, very good frequency characteristics are obtained. Unlike the more conventional pilot signal (19kHz) canceller circuits, which fail to completely remove the pilot signal if it is not at standard level, PA1001-A pilot auto-canceller circuit also includes a pilot signal level detector circuit. Changes in pilot signal level are consequently responded to immediately, resulting in very effective suppression of the pilot signal leak level.

### Filter Circuit

Besides eliminating the sub-carrier signals (more than 23kHz), this PNP transistor 18dB/oct. active filter also serves as an amplifier for the low-pass region, and as a crosstalk canceller.

# 5. DISASSEMBLY

### Side Panels and Top Panel

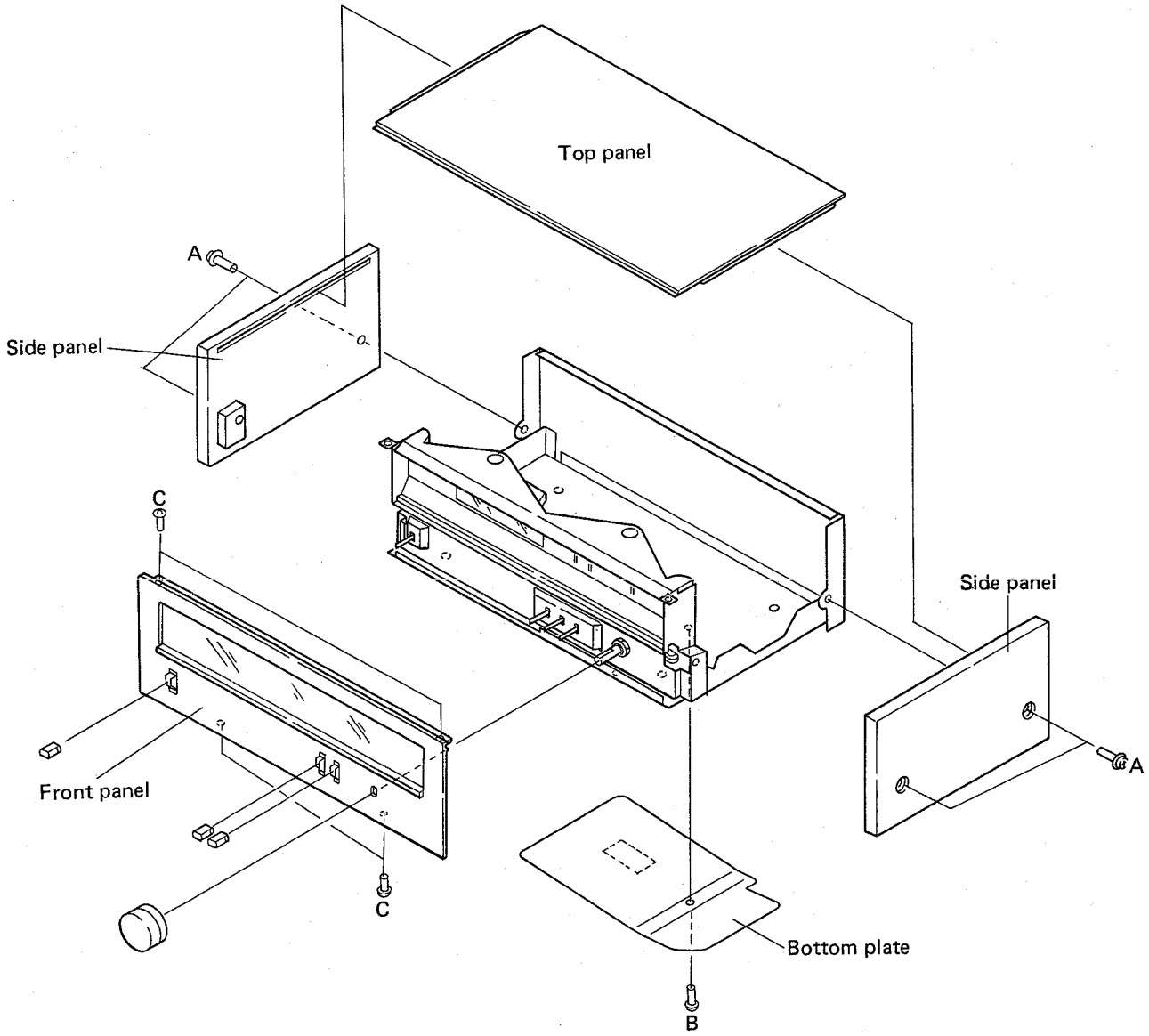
Remove the four screws (A), and remove the side panels.

### Bottom Plate

Remove the screw (B).

### Front Panel

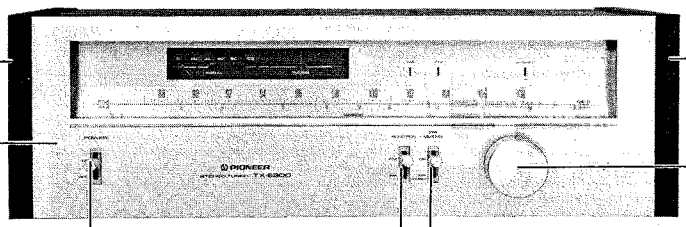
Pull off all the knobs, and remove the four screws (C).



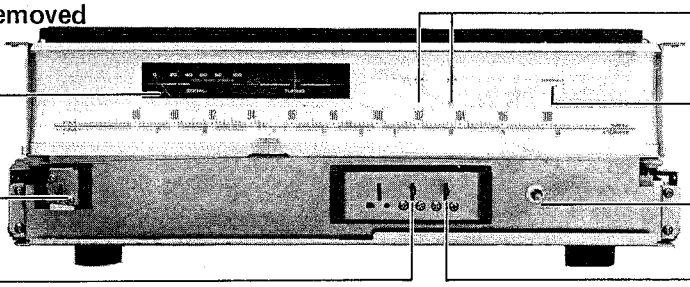
# 6. PARTS LOCATION

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

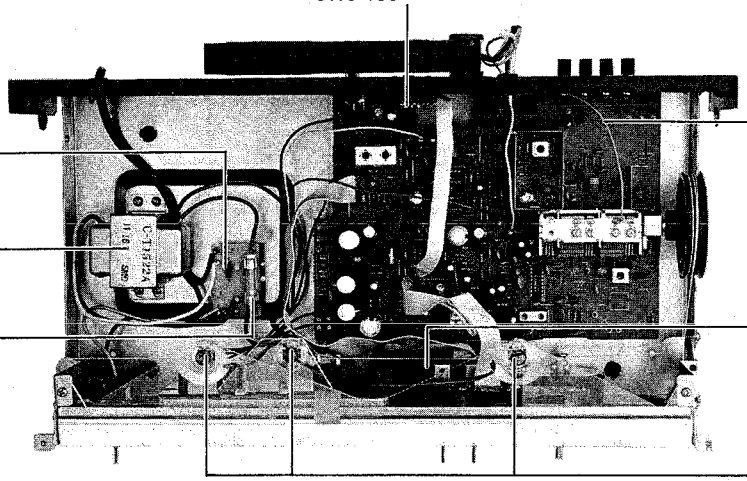
## Front Panel View



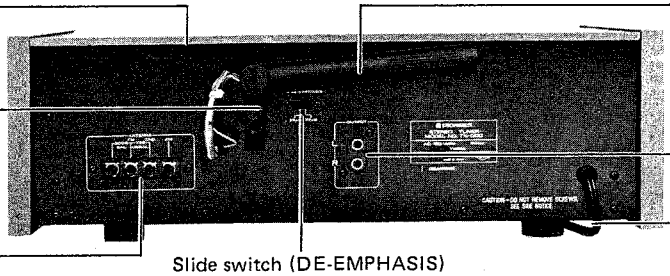

## Front View with Panel Removed




## Top View

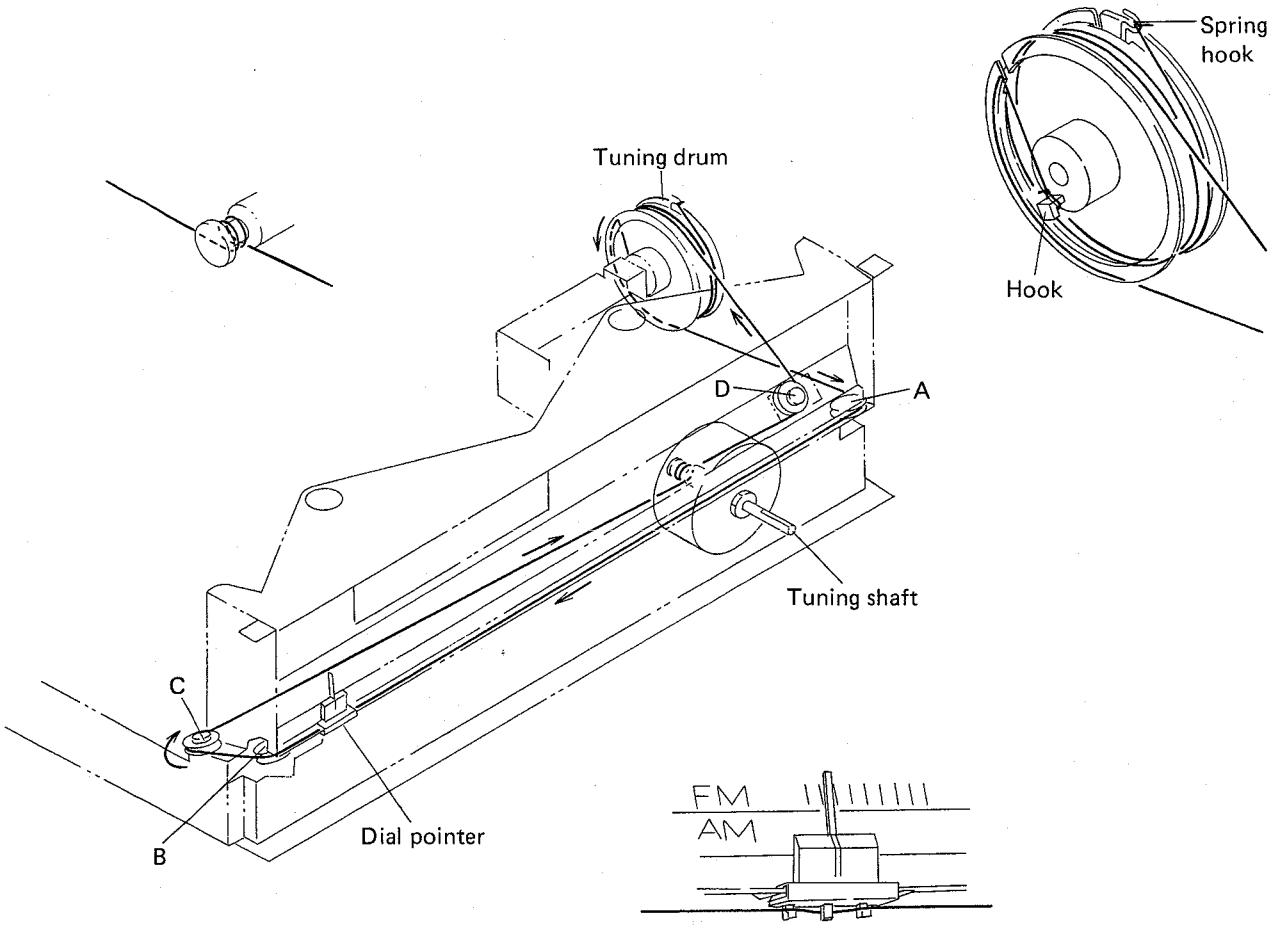



## Rear Panel View



# 7. DIAL CORD STRINGING

1. Remove the wooden case and front panel as described in the "Disassembly" section on page 7.
2. Turn the tuning capacitor shaft fully clockwise.
3. Fix the tuning drum to the tuning capacitor shaft so that the set-screw is uppermost.
4. Tie on end of the dial cord to the hook on the tuning drum.
5. Pass the cord through the cut-out section in the tuning drum, and then take it over pulleys A, B and C in that sequence.
6. Wind the cord around the tuning shaft 2 times.
7. Pass it over pulley D, wind it around the tuning drum 2 times, and finally tie it to the spring hook so that it is tensioned.
8. Turn the tuning shaft, and check that the cord moves smoothly.
9. Cut off any excess cord.
10. Turn the tuning shaft counter-clockwise as far as it will go.
11. Align the dial pointer with the starting point of the dial scale (second division from the left), and then pass the cord over it.
12. Check that the dial pointer is in line with the starting point of the dial scale.
13. Finally apply the locking paint to the cord securing positions (tuning drum hook and spring hook) and the dial pointer connection.



# 8. ADJUSTMENTS

## 8.1 FM TUNER

• Connect the FM SG (FM signal generator) to the FM ANTENNA 300Ω terminals via a 300Ω dummy antenna.
• Switch the FUNCTION selector to the FM position, the FM MUTING switch to the OFF position.
• The tuning coils in the FM front end dose not have an adjusting core. Consequently, tracking adjustments at 90MHz are performed by regulating the gap between rotor and stator of the tuning capacitors ($VC_1$, $VC_3$ and $VC_5$). The expression "adjust VC ($VC_1$, $VC_3$, $VC_5$) found in the text means that the two outer rotor blades of each of these tuning capacitors are to be extended outwards with spatula (Part No. GGK-066) as shown in Fig. 8-1.

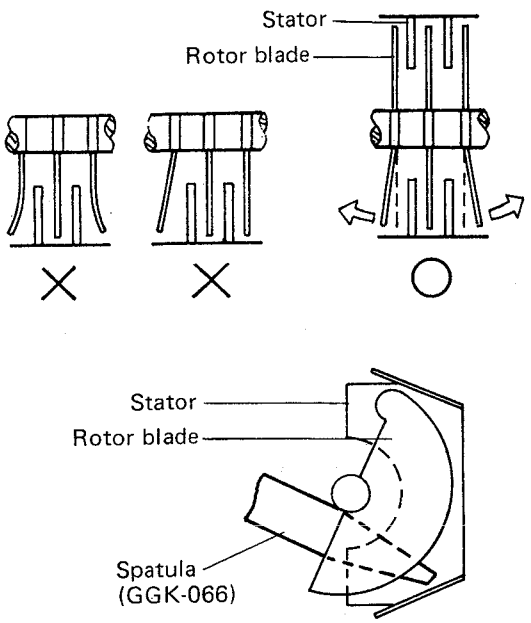



Fig. 8-1 Adjustment of tuning capacitor

1. Set the TX-6800 dial point to a frequency in the 106MHz region so that there will be no input signal.
2. Rotate the N core of $T_2$ to bring the TUNING meter indicator to dead center.
3. Next tune more accurately to 106MHz, and set the FM SG output to 106MHz, 60 to 80dB (modulation—400Hz, ±75kHz deviation).
4. Adjust $TC_5$ to obtain maximum deflection of the SIGNAL meter indicator, and a dead center reading in the TUNING meter.
5. Then tune the dial pointer to 90MHz, and set the FM SG output frequency to 90MHz.
6. Adjust the $VC_5$ to obtain maximum deflection in the SIGNAL meter, and a dead center reading in the TUNING meter.
7. Repeat steps 3 to 6 above.
8. Reset the FM SG output level to 20—30dB, and adjust $TC_1$ and $TC_3$ at 106MHz, and $VC_1$ and $VC_3$ at 90MHz in the same manner as described above in steps 3 to 7. These adjustments will ensure optimum sensitivity in the 90 to 106MHz range, and minimum difference in sensitivity between the two extreme frequencies.
9. Return to a position with no input signal.
10. Rotate the N core of $T_2$ again to set the TUNING meter indicator to dead center.
11. Set the FM SG output to 98MHz and 66dB (modulation—400Hz, ±75kHz deviation), and tune the TX-6800 to this position.
12. Then rotate the D core of $T_2$ to reduce distortion in the demodulator output (OUTPUT terminal) to a minimum.
13. Repeat steps 9 to 12 above until both specifications (center TUNING meter reading in the absence of input signal, and minimum distortion in demodulator output) are satisfactorily met.

### Multiplex Decoder

• Connect the MPX SG (FM multiplex generator) to the FM SG external modulator terminal.
• Set the FM MUTING switch to the ON position.
14. Set the FM SG output to 98MHz and 66dB (unmodulated), and tune the TX-6800 to this position.
15. Adjust $VR_1$ to obtain a 76kHz signal at TP terminal.
16. Then set the FM SG output level to 86dB, and the modulation mode to external. Then with the MPX SG, set Main to 1kHz, L+R to ±67.5kHz deviation, and pilot signal to ±7.5kHz deviation.
17. Rotate the $T_1$ core around by up to 90° in either direction to reduce the demodulator output (OUTPUT terminal) distortion to a minimum.

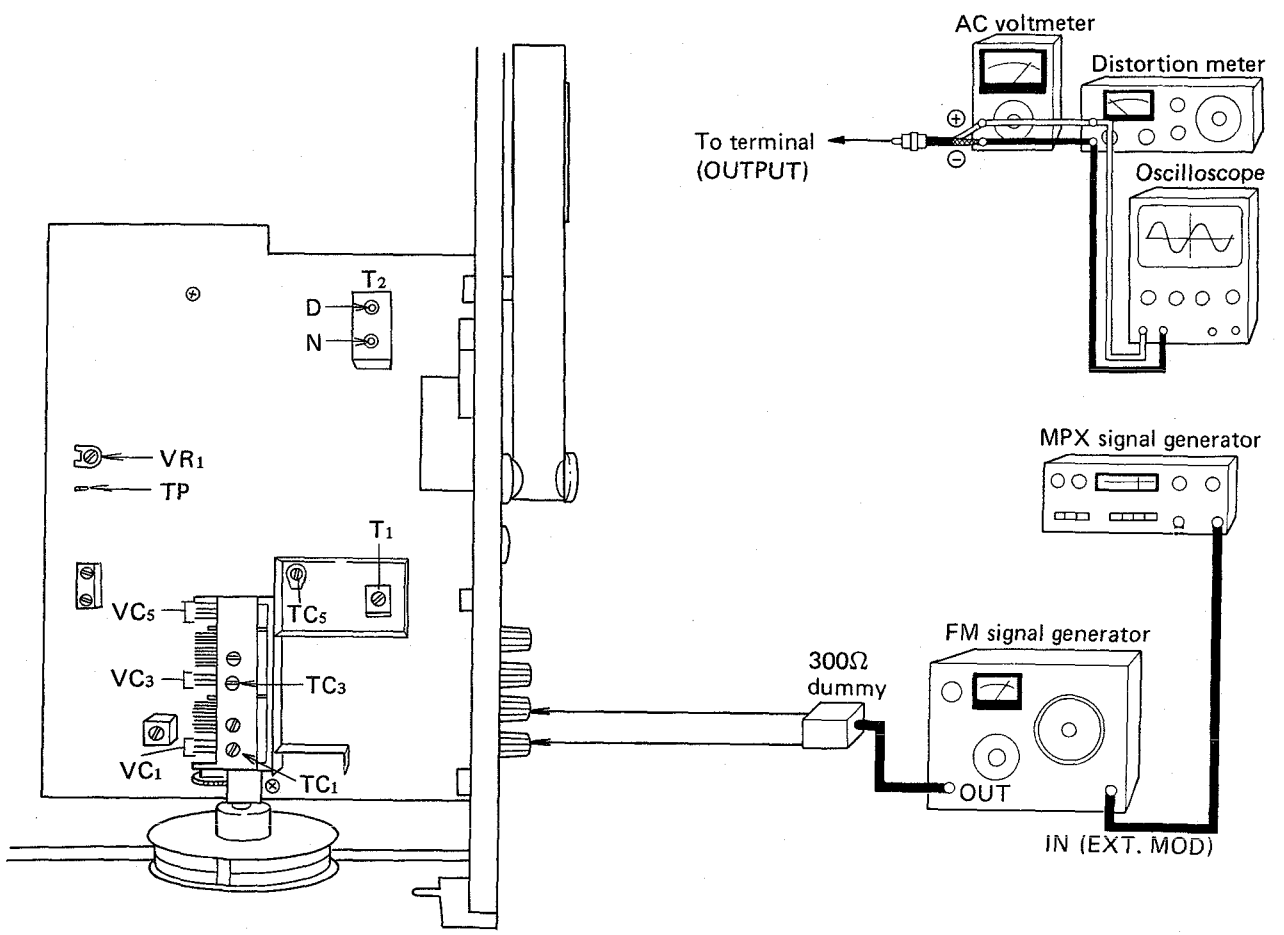



Fig. 8-2 FM tuner adjustments

## 8.2 AM TUNER

• Connect the AM SG (AM signal generator) to the AM ANTENNA terminal via a 1kΩ resistor.
• Switch the FUNCTION selector to the AM position.

1. Tune the TX-6800's dial pointer to 600kHz, and the AM SG output to 600kHz, 100dB (modulation 400Hz, 30%).
2. Adjust the core of $T_3$ to obtain maximum deflection of the SIGNAL meter indicator.
3. Then tune to 1400kHz, and set the AM SG output frequency to 1400kHz also.
4. This time adjust $TC_4$ to obtain maximum SIGNAL meter deflection.
5. Repeat steps 1 to 4 above.
6. Set the AM SG output level to 30dB, adjust the core of the bar-antenna and $T_3$ at 600kHz, and $TC_4$ and $TC_2$ at 1400kHz, in the same manner as described in the above steps. This is the adjustment for optimum sensitivity across the frequency band, and minimum difference in sensitivity at different frequencies.

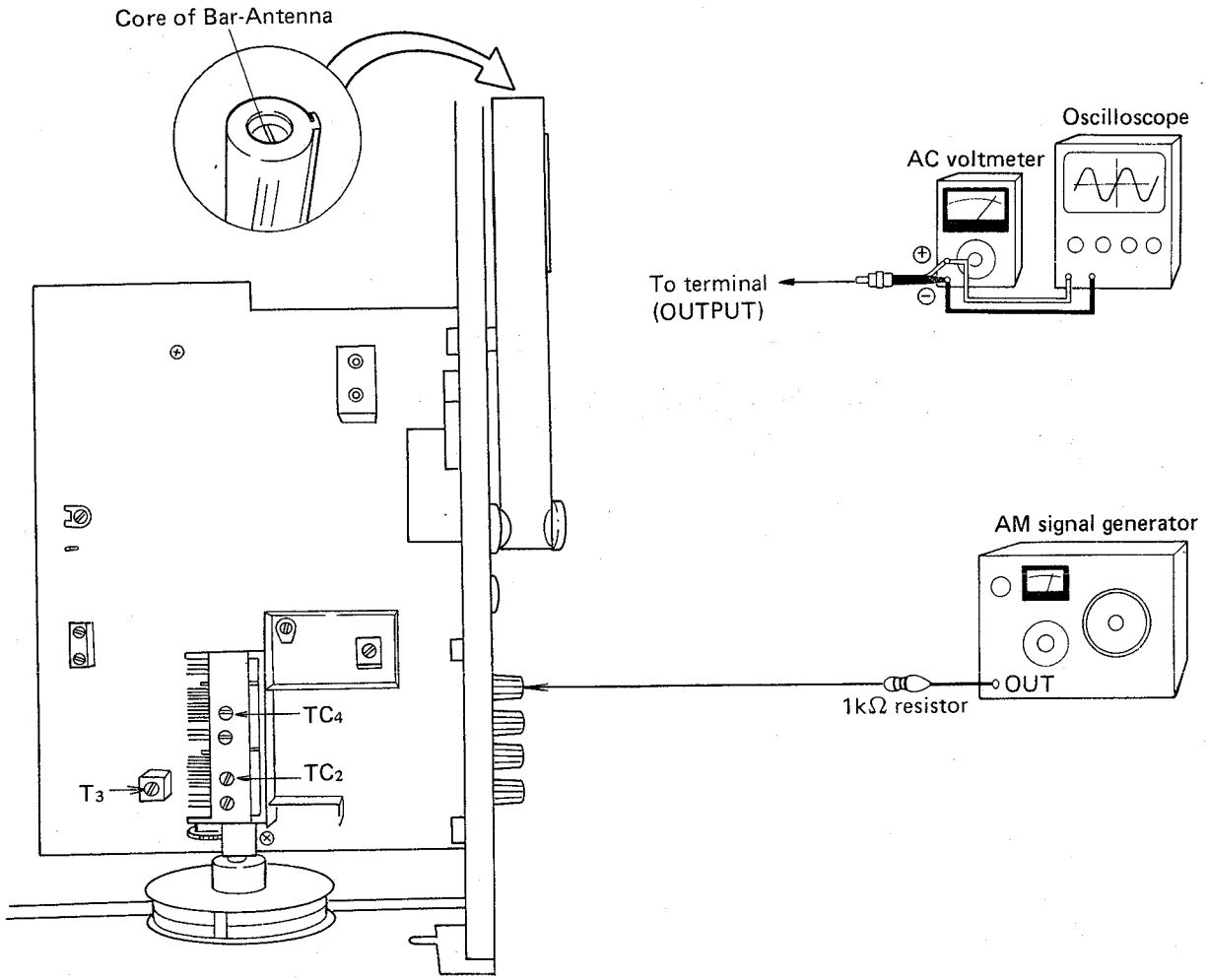
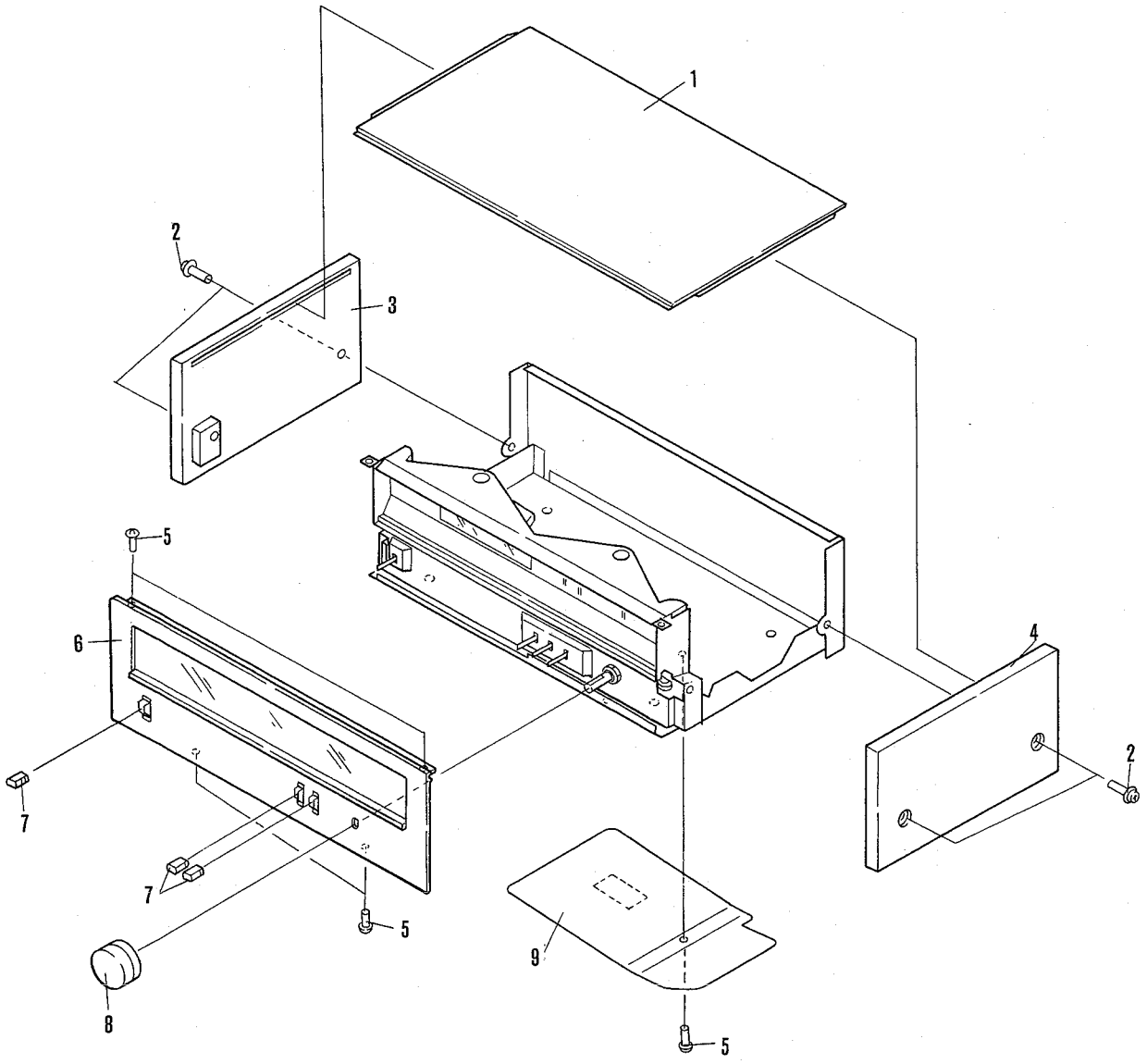



Fig. 8-3 AM tuner adjustments

# 9. EXPLODED VIEW

## 9.1 EXTERIOR COMPONENTS

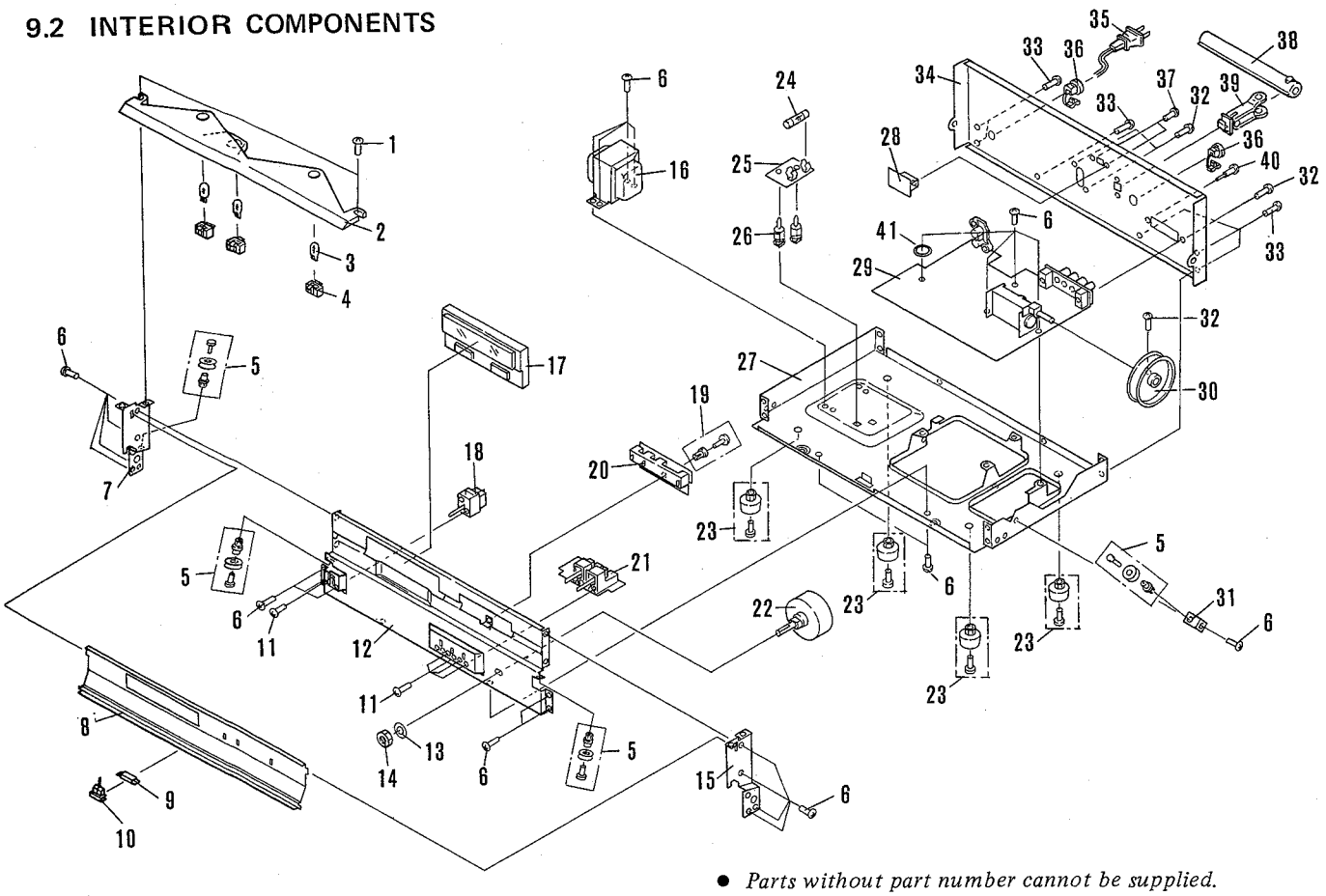



### Parts List

- *Parts without part number cannot be supplied.*

| Key No. | Part No. | Description |
|---|---|---|
| 1. | AMS-035 | Top panel |
| 2. | ABA-206 | Washerfaced screw 4x25 |
| 3. | AMS-033 | Side panel L |
| 4. | AMS-034 | Side panel R |
| 5. | ABA-048 | Screw 3x6 |
| 6. | ANB-721 | Front panel |
| 7. | AAD-183 | Knob (POWER, FUNCTION, MUTING) |
| 8. | AAA-058 | Knob (TUNING) |
| 9. | | Bottom plate |

## 9.2 INTERIOR COMPONENTS



- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

### Parts List

| Key No. | Part No. | Description |
|---|---|---|
| 1. | ABA-049 | Screw 3x8 |
| 2. | | Acrylic board |
| 3. | AEL-029 | Lamp (wedge type) |
| 4. | AKK-005 | Lamp socket (wedge type) |
| 5 | | Pulley assembly |
| 6. | ABA-048 | Screw 3x6 |
| 7. | | Side plate L |
| 8. | | Dial scale board |
| 9. | | Smoother |
| 10. | | Dial pointer |
| 11. | ABA-025 | Pan head screw 3x4 |
| 12. | | Sub-panel |
| 13. | B22-018 | Flat washer |
| 14. | B71-010 | Nut 7 $\phi$ |
| 15. | | Side plate R |
| ⚠16. | ATT-612 | Power transformer |
| 17. | AAW-102 | Twin meter |
| ⚠18. | ASK-514 | Lever switch (POWER) |
| 19. | AEC-352 | Nylon rivet |
| 20. | GWX-308 | LED assembly |

| Key No. | Part No. | Description |
|---|---|---|
| 21. | GWS-187 | Switch assembly |
| 22. | AXA-228 | Tuning shaft assembly |
| 23. | AEC-546 | Foot assembly |
| ⚠24. | AEK-106 | Fuse (1A) |
| 25. | AWR-200 | Fuse assembly |
| 26. | AEC-554 | P.C. board holder |
| 27. | | Chassis |
| 28. | GWS-188 | De-emphasis assembly |
| 29. | GWM-135 | Tuner assembly |
| 30. | | Tuning drum |
| 31. | | Angle |
| 32. | ABA-082 | Screw 3x10 |
| 33. | ABA-228 | Screw 3x6 |
| 34. | | Rear panel |
| ⚠35. | ADG-023 | AC power cord |
| 36. | AEC-327 | Strain relief |
| 37. | ABA-034 | Pan head screw 3x4 |
| 38. | ATB-505 | Bar-antenna |
| 39. | AXB-012 | Antenna holder |
| 40. | ABA-115 | Special screw |
| 41. | ABE-035 | Washer |

## 10.4 PARTS LIST OF P.C. BOARD ASSEMBLIES

### Tuner Assembly (GWM-135)

#### COILS AND TRANSFORMERS

| Part No. | Symbol & Description | |
|---|---|---|
| ATE-008 | T1 | FM IFT |
| ATE-043 | T2 | FM det. transformer |
| ATB-063 | T3 | AM OSC coil |
| T24-028 | L5 | RF choke coil |
| ATF-049 | F1, F2 | FM ceramic filter |
| ATF-074 | F3 | AM ceramic filter (450kHz) |

#### CAPACITORS

| Part No. | Symbol & Description | |
|---|---|---|
| ACK-012 | VC | Tuning capacitor |
| ACM-006 | TC5 | Trimmer |
| CCDUJ 090D 50 | C1 | |
| CGB R47K 500 | C9 | |
| CCDXL 080F 50 | C63 | |
| CCDCH 080F 50 | C11 | |
| CCDUJ 150K 50 | C3 | |
| CCDRH 150K 50 | C10 | |
| CCDCH 150K 50 | C13 | |
| CCDCH 330K 50 | C12 | |
| CCDSL 060D 50 | C4 | |
| CCDSL 101K 50 | C5, C25 | |
| CCDSL 221K 50 | C58 | |
| CKDYB 391K 50 | C76, C77 | |
| CKDYB 152K 50 | C74, C75 | |
| CKDYB 182K 50 | C78, C79 | |
| CKDYB 472K 50 | C40, C41 | |
| CKDYB 821K 50 | C45 | |
| CKDYF 103Z 50 | C2, C6, C7, C8, C14, C16, C18, C27, C28, C31, C32, C33, C54, C55, C56, C65, C66, C69, C70, C73, C61 | |
| CKDYF 473Z 50 | C17, C20, C22, C23, C29, C30, C37, C49, C53, C57, C62, C67, C68, C89 | |
| CQSH 331K 50 | C64 | |
| CQSH 511J 50 | C48 | |
| CEANL R47M 50 | C80, C81 | |
| CEANL 010M 50 | C44, C46 | |
| CEANL 6R8M 25 | C47 | |
| CEA 010P 50 | C19, C24, C26, C43 | |
| CEA 100P 16 | C36, C38, C50, C51, C52, C71, C72 | |
| CEA 102P 16 | C82, C83 | |
| CEA 2R2P 50 | C21 | |
| CEA 220P 16 | C15 | |
| CEA 221P 6 | C34 | |
| CEA 331P 25 | C85 | |
| CEA 331P 16 | C39 | |
| CEA 330P 16 | C35 | |
| CEA 4R7P 35 | C60 | |
| CEA 470P 10 | C59 | |
| CEA 470P 16 | C86 | |
| CEA 471P 6 | C42 | |
| CEA 471P 25 | C84 | |

#### SEMICONDUCTORS

| Part No. | Symbol & Description |
|---|---|
| 2SK168 | Q1 |
| 2SC535 | Q2 |
| 2SC461 | Q3, Q4, Q11 |
| 2SA726S-F (2SA750) | Q7, Q8 |
| 2SC945A (2SC2575) | Q9 |
| 2SD313 (2SD712) | Q12 |
| PA3001-A | Q5 |
| PA1001-A | Q6 |
| HA1138 | Q10 |
| 1S2076 (1S1555) (1S2473) | D1–D8 |
| ⚠10E2 | D10, D11 |
| ⚠(SIB01–02) | |
| MZ-140 (WZ-140) | D12 |
| MZ-081 (WZ-081) | D9 |

*Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

#### RESISTORS

| Part No. | Symbol & Description | |
|---|---|---|
| ACP-079 | VR1 | Semi-fixed 4.7k-B |
| RD¼PM □□□J | R1–R46, R48–R83, R90, R91 | |
| RN¼PQ □□□□F | R47 | |

### LED Assembly (GWX-308)

| Part No. | Symbol & Description | |
|---|---|---|
| AEL-315 | D13 | LED (STEREO) |
| AEL-319 | D14, D15 | LED (AM, FM) |
| RD¼PM 561J | R84, R86, R88 | |
| RD¼PM 182J | R85, R87 | |
| ABA-082 | | Screw 3 x 10 |

### Switch Assembly (GWS-187)

| Part No. | Symbol & Description | |
|---|---|---|
| ASK-157 | S1 | Lever switch (FM MUTING) |
| ASK-155 | S2 | Lever switch (FUNCTION) |
| RD¼PM 104J | R89 | |

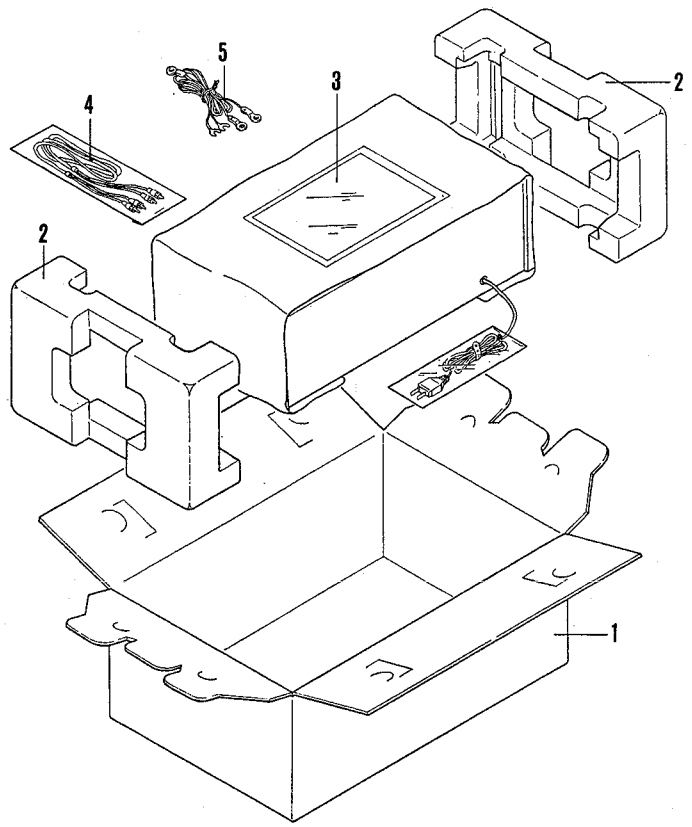
### Fuse Assembly (AWR-200)

| Part No. | Symbol & Description | |
|---|---|---|
| ⚠ ACN-029 | R1 | Carbon composition resistor |

### De-Emphasis Assembly (GWS-188)

| Part No. | Symbol & Description | |
|---|---|---|
| CQMA 113J 50 | C87, C88 | |
| ASH-015 | S3 | Slide switch (DE-EMPHASIS) |

# 11. PACKING




### Parts List

| Key No. | Part No. | Description |
|---|---|---|
| 1. | AHD-694 | Packing case |
| 2. | AHA-188 | Side pad |
| 3. | ARB-319 | Operating instructions |
| 4. | ADE-005 | Connection cord |
| 5. | ADH-002 | T-type FM antenna |

# 12. SUPPLEMENTS FOR MODEL TX-608/KU

Model TX-608/KU is the same as Model TX-6800/KU with exception of descriptions in this supplements.

## Contrast of Miscellaneous Parts

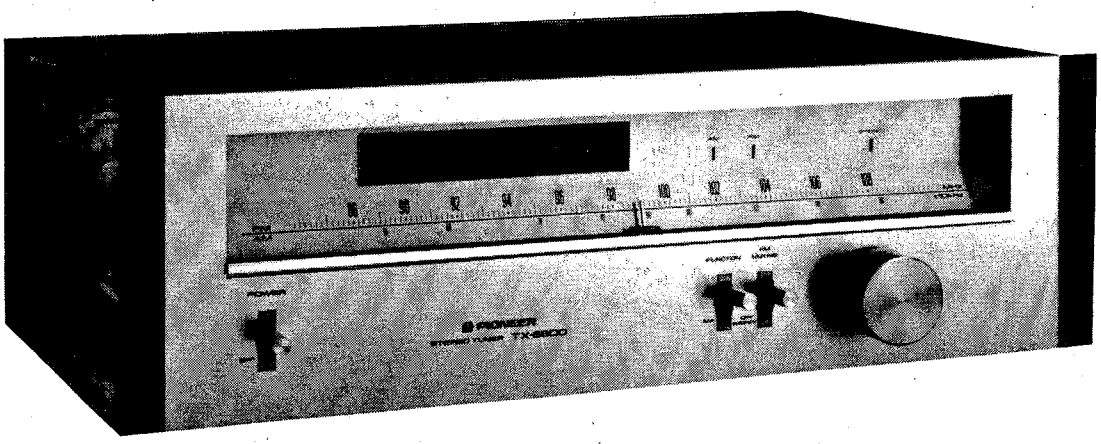
| Symbol | Description | Part No. | | Remarks |
|---|---|---|---|---|
| | | TX-6800/KU | TX-608/KU | |
| | Front panel | ANB-721 | ANB-737 | |
| | Side panel L | AMS-033 | ..... | |
| | Side panel R | AMS-034 | ..... | |
| | Top panel | AMS-035 | ..... | |
| | Bonnet case | ..... | ANE-249 | |
| | Screw 4 x 25 | ABA-206 | ..... | for side panels |
| | Screw 4 x 6 | ..... | ABA-180 | for bonnet case |
| | Operating instructions | ARB-319 | ARB-335 | |
| | Packing case | AHD-694 | AHD-705 | |
| | Side pad | AHA-188 | AHA-189 | |

AM/FM STEREO TUNER

# TX-6800
# TX-608

# SERVICE MANUAL

Original



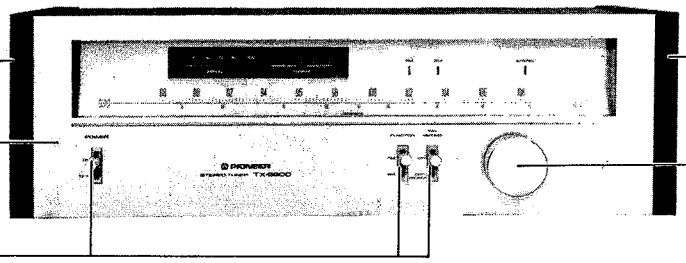
PIONEER®

721

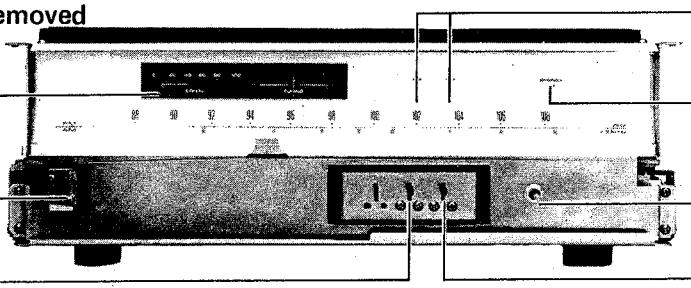
# PARTS LOCATION

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

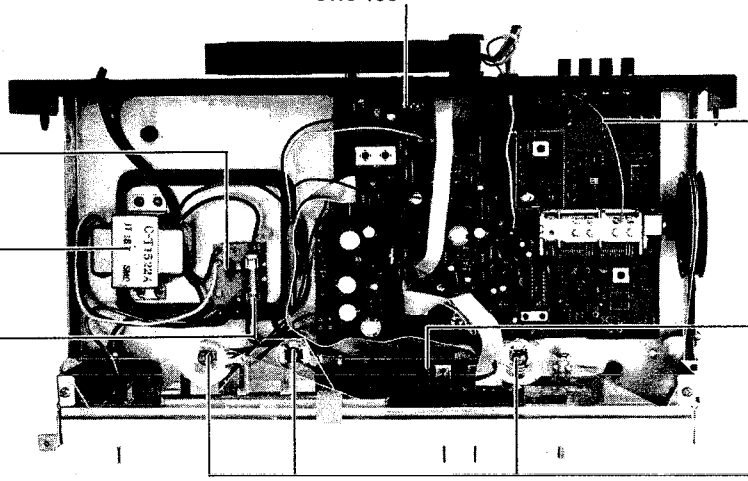
## Front Panel View



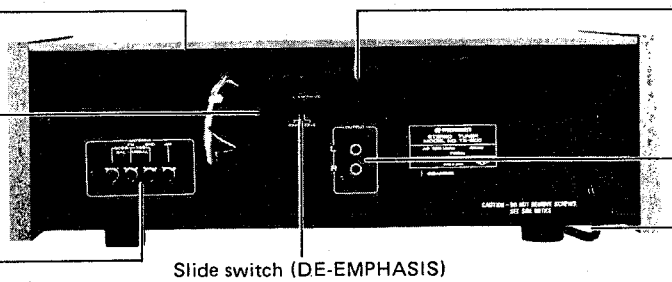

## Front View with Panel Removed




## Top View

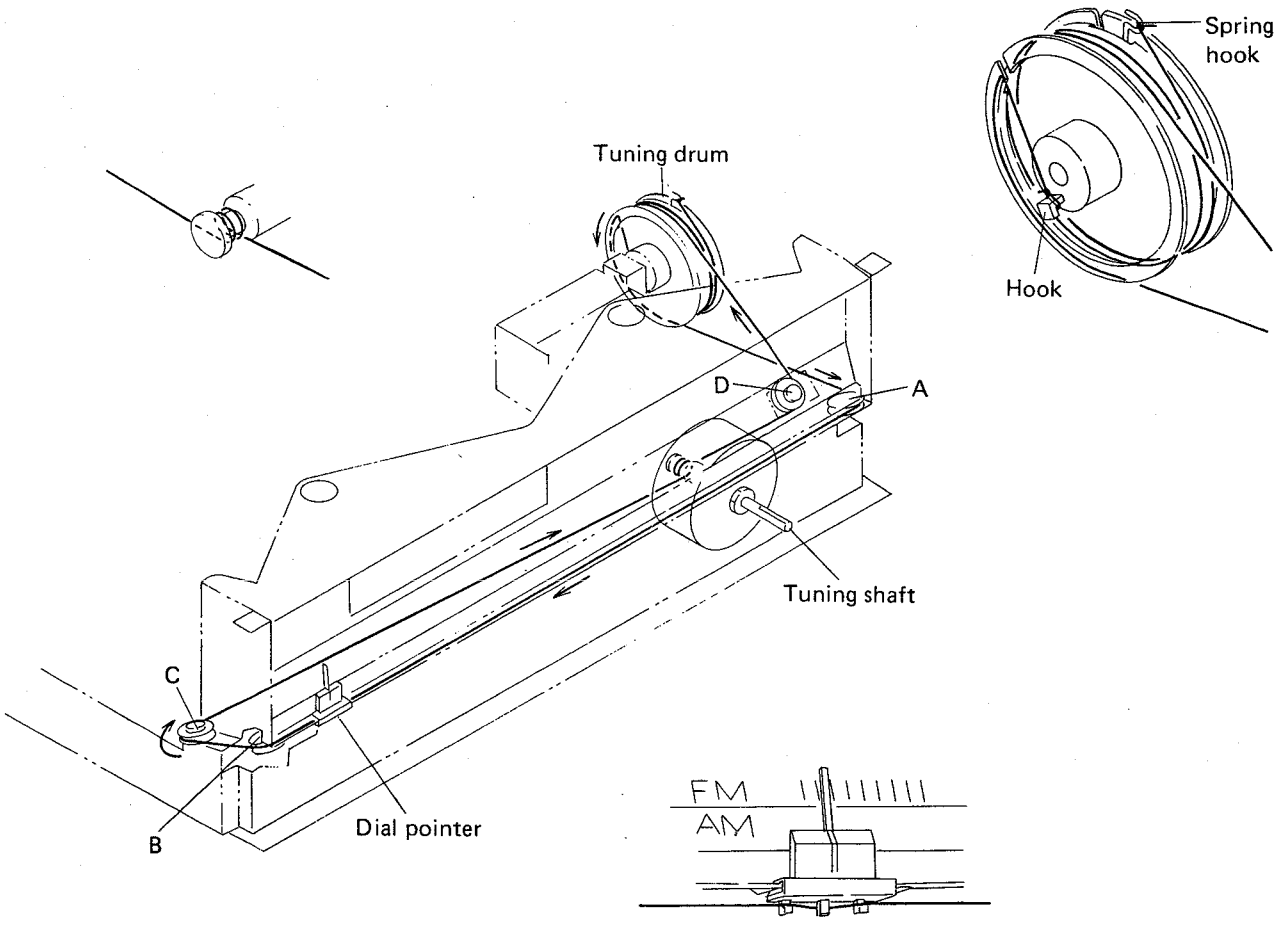



## Rear Panel View



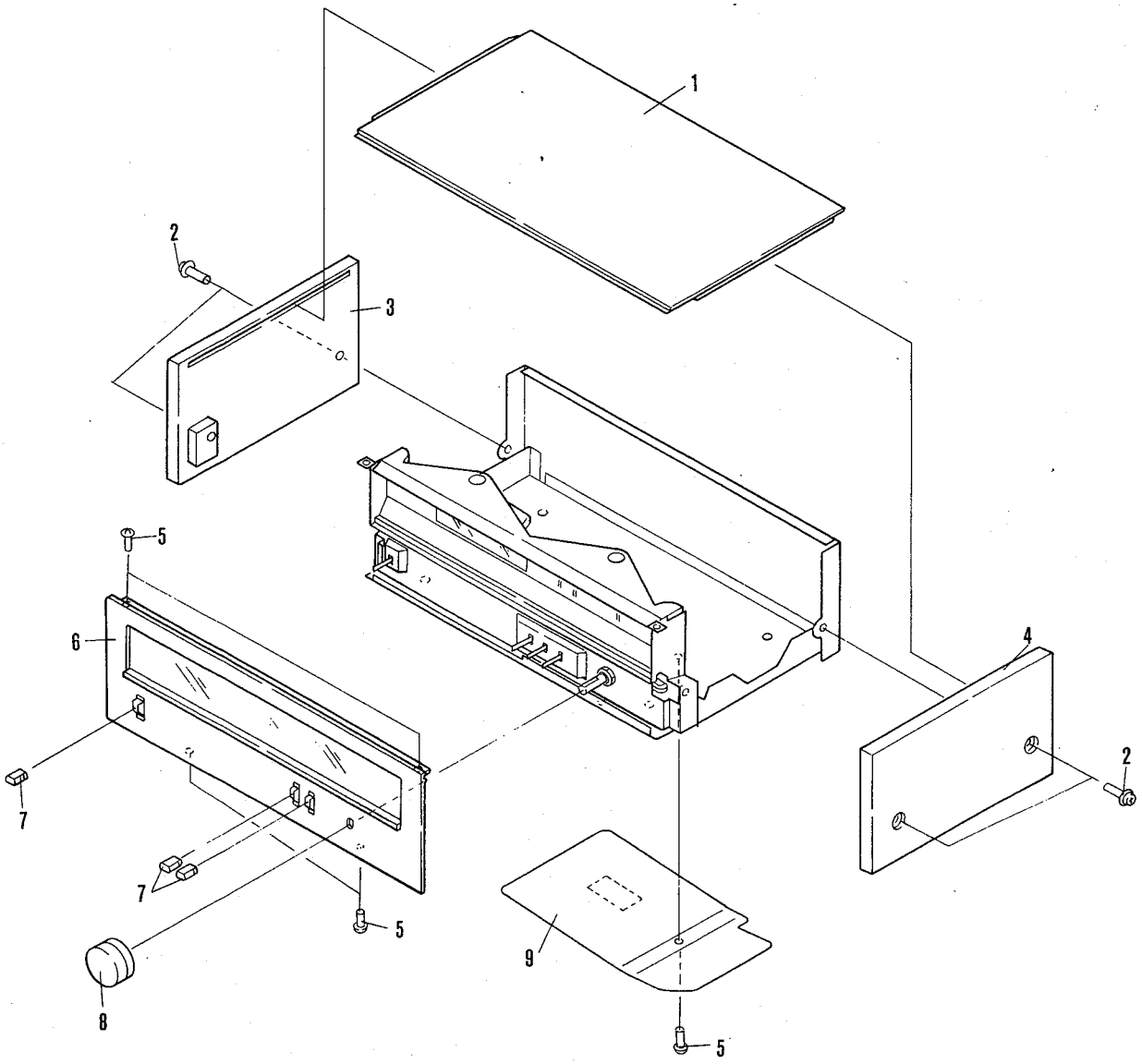
# DIAL CORD STRINGING

1. Remove the wooden case and front panel as described in the "Disassembly" section on page 7.
2. Turn the tuning capacitor shaft fully clockwise.
3. Fix the tuning drum to the tuning capacitor shaft so that the set-screw is uppermost.
4. Tie on end of the dial cord to the hook on the tuning drum.
5. Pass the cord through the cut-out section in the tuning drum, and then take it over pulleys A, B and C in that sequence.
6. Wind the cord around the tuning shaft 2 times.
7. Pass it over pulley D, wind it around the tuning drum 2 times, and finally tie it to the spring hook so that it is tensioned.
8. Turn the tuning shaft, and check that the cord moves smoothly.
9. Cut off any excess cord.
10. Turn the tuning shaft counter-clockwise as far as it will go.
11. Align the dial pointer with the starting point of the dial scale (second division from the left), and then pass the cord over it.
12. Check that the dial pointer is in line with the starting point of the dial scale.
13. Finally apply the locking paint to the cord securing positions (tuning drum hook and spring hook) and the dial pointer connection.



# EXPLODED VIEW

## 9.1 EXTERIOR COMPONENTS

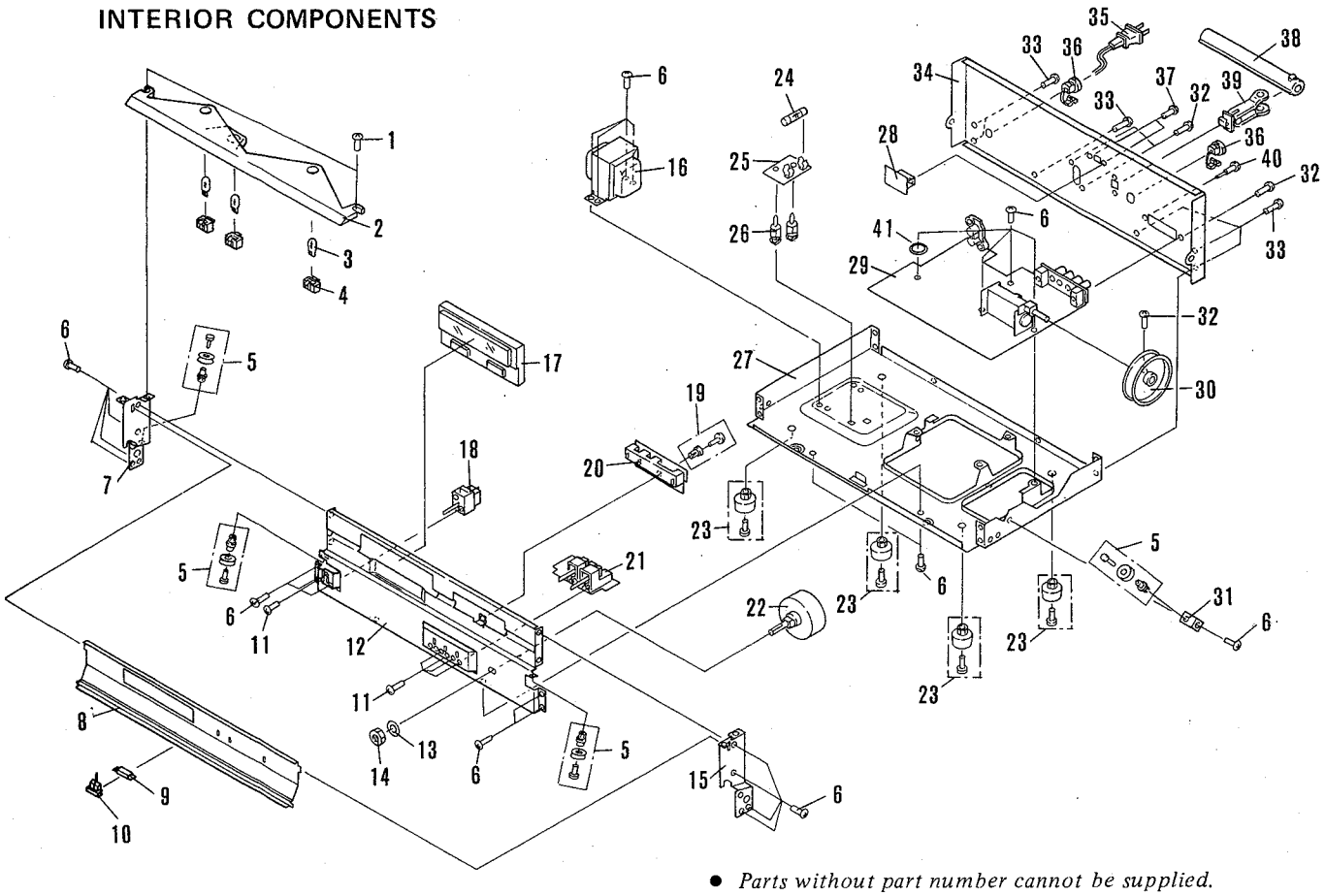



### Parts List

- *Parts without part number cannot be supplied.*

| Key No. | Part No. | Description |
|---|---|---|
| 1. | AMS-035 | Top panel |
| 2. | ABA-206 | Washerfaced screw 4x25 |
| 3. | AMS-033 | Side panel L |
| 4. | AMS-034 | Side panel R |
| 5. | ABA-048 | Screw 3x6 |
| 6. | ANB-721 | Front panel |
| 7. | AAD-183 | Knob (POWER, FUNCTION, MUTING) |
| 8. | AAA-058 | Knob (TUNING) |
| 9. | | Bottom plate |

## INTERIOR COMPONENTS




- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

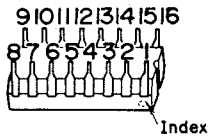
## Parts List

| Key No. | Part No. | Description |
|---|---|---|
| 1. | ABA-049 | Screw 3x8 |
| 2. | | Acrylic board |
| 3. | AEL-029 | Lamp (wedge type) |
| 4. | AKK-005 | Lamp socket (wedge type) |
| 5 | | Pulley assembly |
| 6. | ABA-048 | Screw 3x6 |
| 7. | | Side plate L |
| 8. | | Dial scale board |
| 9. | | Smoother |
| 10. | | Dial pointer |
| 11. | ABA-025 | Pan head screw 3x4 |
| 12. | | Sub-panel |
| 13. | B22-018 | Flat washer |
| 14. | B71-010 | Nut 7 $\phi$ |
| 15. | | Side plate R |
| ⚠16. | ATT-612 | Power transformer |
| 17. | AAW-102 | Twin meter |
| ⚠18. | ASK-514 | Lever switch (POWER) |
| 19. | AEC-352 | Nylon rivet |
| 20. | GWX-308 | LED assembly |

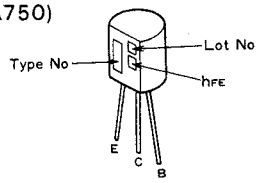
| Key No. | Part No. | Description |
|---|---|---|
| 21. | GWS-187 | Switch assembly |
| 22. | AXA-228 | Tuning shaft assembly |
| 23. | AEC-546 | Foot assembly |
| ⚠24. | AEK-106 | Fuse (1A) |
| 25. | AWR-200 | Fuse assembly |
| 26. | AEC-554 | P.C. board holder |
| 27. | | Chassis |
| 28. | GWS-188 | De-emphasis assembly |
| 29. | GWM-135 | Tuner assembly |
| 30. | | Tuning drum |
| 31. | | Angle |
| 32. | ABA-082 | Screw 3x10 |
| 33. | ABA-228 | Screw 3x6 |
| 34. | | Rear panel |
| ⚠35. | ADG-023 | AC power cord |
| 36. | AEC-327 | Strain relief |
| 37. | ABA-034 | Pan head screw 3x4 |
| 38. | ATB-505 | Bar-antenna |
| 39. | AXB-012 | Antenna holder |
| 40. | ABA-115 | Special screw |
| 41. | ABE-035 | Washer |

## External Appearance of Transistors and ICs

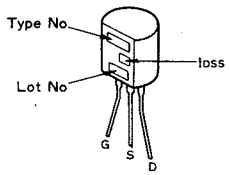
PA3001-A
PA1001-A
HA1138



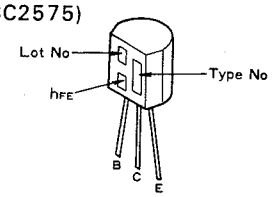

(2SA750)



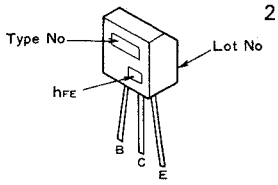

2SK168



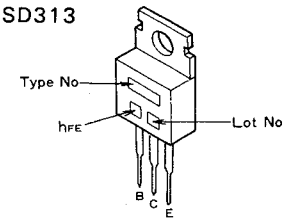

(2SC2575)



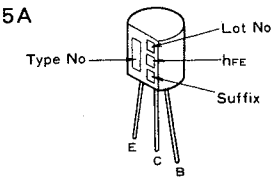

2SC535
2SC461



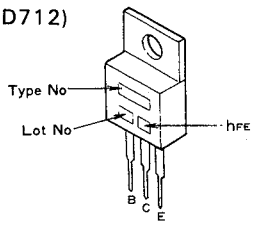

2SD313



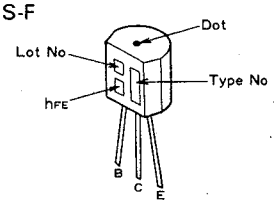

2SC945A




(2SD712)




2SA726S-F




## Miscellaneous Parts

### LAMPS AND FUSE

| Part No. | Symbol & Description | |
|---|---|---|
| AEL-029 | PL1-PL3 | Lamp (wedge type) |
| ⚠ AEK-106 | FU1 | Fuse (1A) |

### P.C. BOARD ASSEMBLIES

| Part No. | Description |
|---|---|
| GWM-135 | Tuner assembly |
| GWS-187 | Switch assembly |
| GWS-188 | De-emphasis assembly |
| GWX-308 | LED assembly |
| AWR-200 | Fuse assembly |

### OTHERS

| Part No. | Symbol & Description | |
|---|---|---|
| ⚠ ATT-612 | T1 | Power transformer |
| ATB-505 | T2 | Bar-antenna |
| ⚠ ASK-514 | S1 | Lever switch (POWER) |
| AAW-102 | | Twin meter (SIGNAL/TUNING) |
| AKK-005 | | Lamp socket (wedge type) |
| ⚠ ADG-023 | | AC power cord |

## Switch Assembly (GWS-187)

| Part No. | Symbol & Description | |
|---|---|---|
| ASK-157 | S1 | Lever switch (FM MUTING) |
| ASK-155 | S2 | Lever switch (FUNCTION) |
| RD¼PM 104J | R89 | |

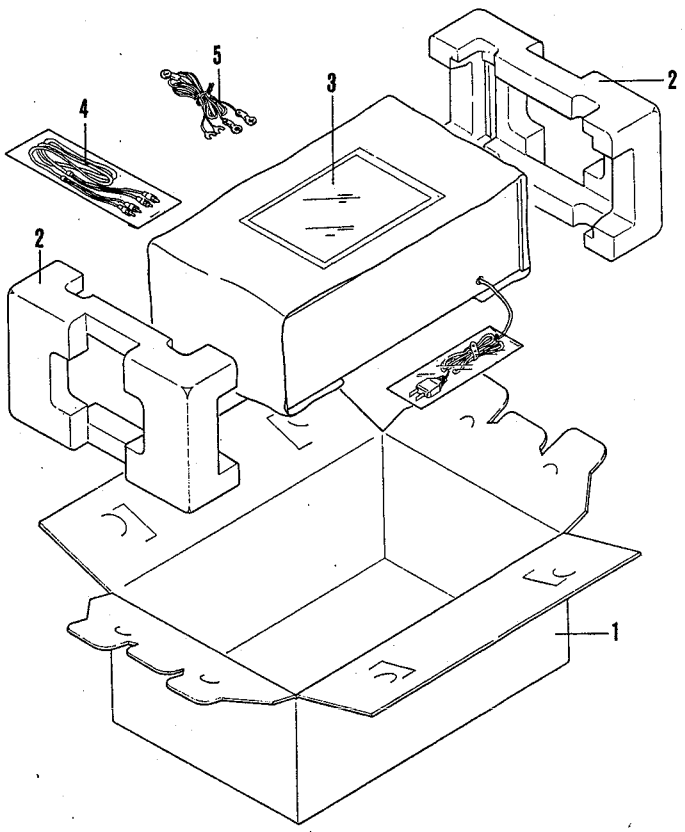
## De-Emphasis Assembly (GWS-188)

| Part No. | Symbol & Description | |
|---|---|---|
| CQMA 113J 50 | C87, C88 | |
| ASH-015 | S3 | Slide switch (DE-EMPHASIS) |

## Fuse Assembly (AWR-200)

| Part No. | Symbol & Description | |
|---|---|---|
| ⚠ACN-029 | R1 | Carbon composition resistor |

# PACKING




## Parts List

| Key No. | Part No. | Description |
|---|---|---|
| 1. | AHD-694 | Packing case |
| 2. | AHA-188 | Side pad |
| 3. | ARB-319 | Operating instructions |
| 4. | ADE-005 | Connection cord |
| 5. | ADH-002 | T-type FM antenna |

# PARTS LIST OF P.C. BOARD ASSEMBLIES

## Tuner Assembly (GWM-135)

### COILS AND TRANSFORMERS

| Part No. | Symbol & Description | |
|---|---|---|
| ATE-008 | T1 | FM IFT |
| ATE-043 | T2 | FM det. transformer |
| ATB-063 | T3 | AM OSC coil |
| T24-028 | L5 | RF choke coil |
| ATF-049 | F1, F2 | FM ceramic filter |
| ATF-074 | F3 | AM ceramic filter (450kHz) |

### CAPACITORS

| Part No. | Symbol & Description | |
|---|---|---|
| ACK-012 | VC | Tuning capacitor |
| ACM-006 | TC5 | Trimmer |
| CCDUJ 090D 50 | C1 | |
| CGB R47K 500 | C9 | |
| CCDXL 080F 50 | C63 | |
| CCDCH 080F 50 | C11 | |
| CCDUJ 150K 50 | C3 | |
| CCDRH 150K 50 | C10 | |
| CCDCH 150K 50 | C13 | |
| CCDCH 330K 50 | C12 | |
| CCDSL 060D 50 | C4 | |
| CCDSL 101K 50 | C5, C25 | |
| CCDSL 221K 50 | C58 | |
| CKDYB 391K 50 | C76, C77 | |
| CKDYB 152K 50 | C74, C75 | |
| CKDYB 182K 50 | C78, C79 | |
| CKDYB 472K 50 | C40, C41 | |
| CKDYB 821K 50 | C45 | |
| CKDYF 103Z 50 | C2, C6, C7, C8, C14, C16, C18, C27, C28, C31, C32, C33, C54, C55, C56, C65, C66, C69, C70, C73, C61 | |
| CKDYF 473Z 50 | C17, C20, C22, C23, C29, C30, C37, C49, C53, C57, C62, C67, C68, C89 | |
| CQSH 331K 50 | C64 | |
| CQSH 511J 50 | C48 | |
| CEANL R47M 50 | C80, C81 | |
| CEANL 010M 50 | C44, C46 | |
| CEANL 6R8M 25 | C47 | |
| CEA 010P 50 | C19, C24, C26, C43 | |
| CEA 100P 16 | C36, C38, C50, C51, C52, C71, C72 | |
| CEA 102P 16 | C82, C83 | |
| CEA 2R2P 50 | C21 | |
| CEA 220P 16 | C15 | |
| CEA 221P 6 | C34 | |
| CEA 331P 25 | C85 | |
| CEA 331P 16 | C39 | |
| CEA 330P 16 | C35 | |
| CEA 4R7P 35 | C60 | |
| CEA 470P 10 | C59 | |
| CEA 470P 16 | C86 | |
| CEA 471P 6 | C42 | |
| CEA 471P 25 | C84 | |

### SEMICONDUCTORS

| Part No. | Symbol & Description |
|---|---|
| 2SK168 | Q1 |
| 2SC535 | Q2 |
| 2SC461 | Q3, Q4, Q11 |
| 2SA726S-F (2SA750) | Q7, Q8 |
| 2SC945A (2SC2575) | Q9 |
| 2SD313 (2SD712) | Q12 |
| PA3001-A | Q5 |
| PA1001-A | Q6 |
| HA1138 | Q10 |
| 1S2076 (1S1555) (1S2473) | D1–D8 |
| ⚠10E2 ⚠(SIB01–02) | D10, D11 |
| MZ-140 (WZ-140) | D12 |
| MZ-081 (WZ-081) | D9 |

### RESISTORS

*Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

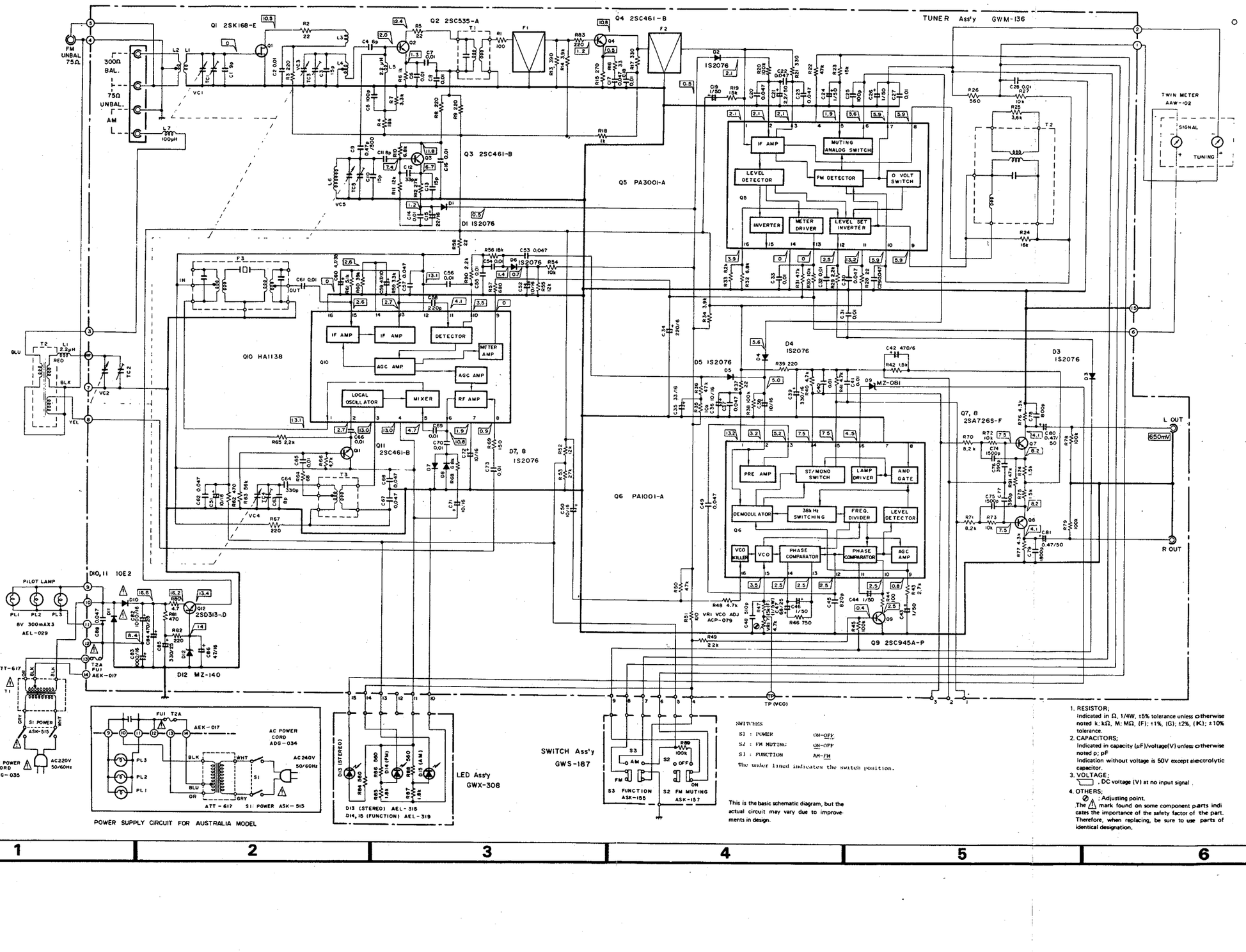
| Part No. | Symbol & Description | |
|---|---|---|
| ACP-079 | VR1 | Semi-fixed 4.7k-B |
| RD¼PM □□□J | R1–R46, R48–R83, R90, R91 | |
| RN¼PQ □□□□F | R47 | |

## LED Assembly (GWX-308)

| Part No. | Symbol & Description | |
|---|---|---|
| AEL-315 | D13 | LED (STEREO) |
| AEL-319 | D14, D15 | LED (AM, FM) |
| RD¼PM 561J | R84, R86, R88 | |
| RD¼PM 182J | R85, R87 | |
| ABA-082 | | Screw 3 x 10 |

## SCHEMATIC DIAGRAM

*NOTE:*
*The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.*




POWER SUPPLY CIRCUIT FOR AUSTRALIA MODEL

SWITCHES

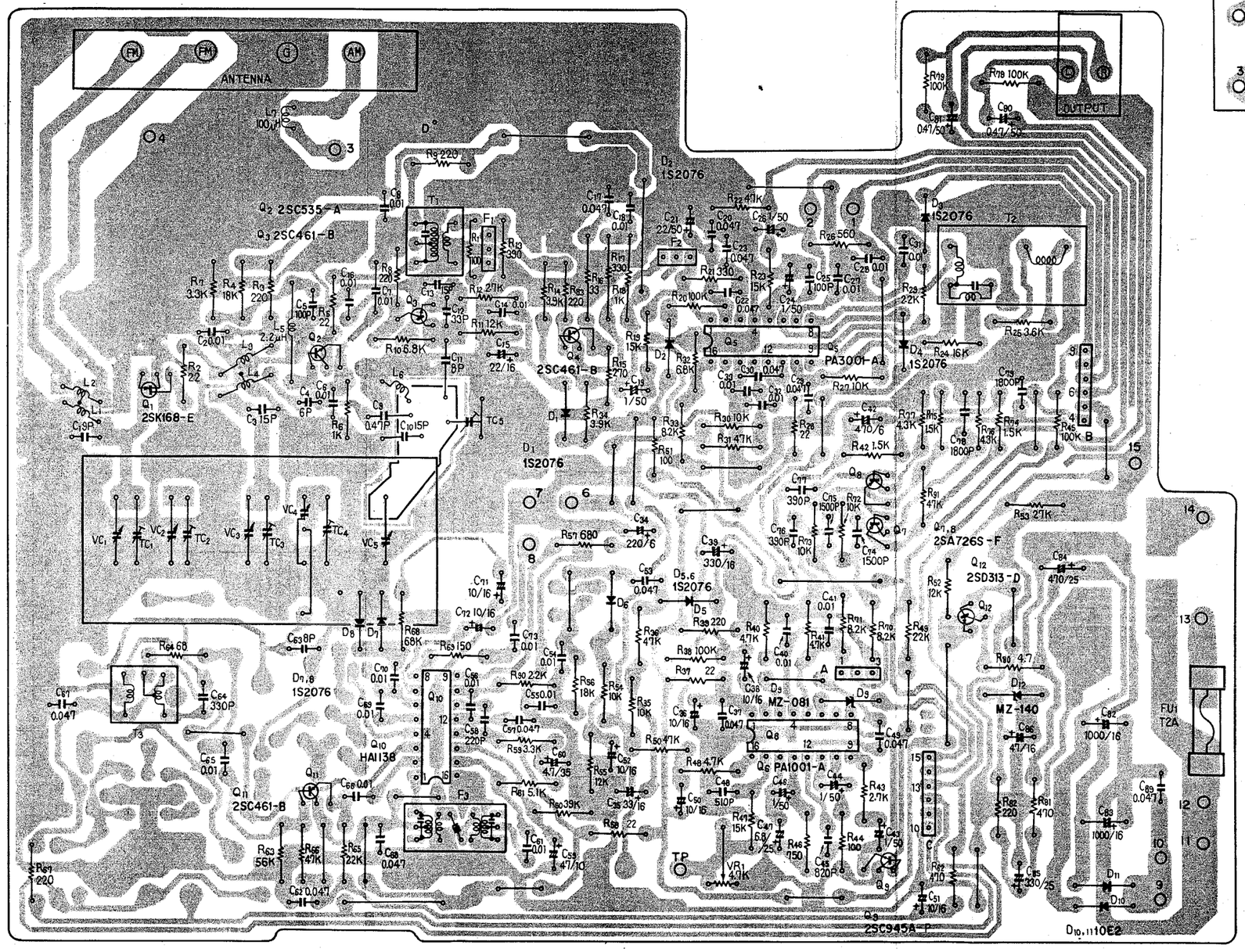
| | | |
|---|---|---|
| S1 : POWER | | ON-OFF |
| S2 : FM MUTING | | ON-OFF |
| S3 : FUNCTION | | AM-FM |

The under lined indicates the switch position.

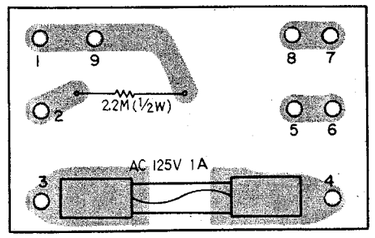
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

1. RESISTOR;
Indicated in Ω, 1/4W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10% tolerance.
2. CAPACITORS;
Indicated in capacity (μF)/voltage(V) unless otherwise noted p; pF
Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE;
, DC voltage (V) at no input signal
4. OTHERS;
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

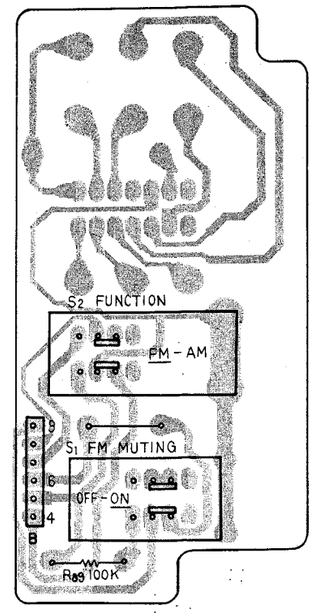
# TX-608/HE,HP



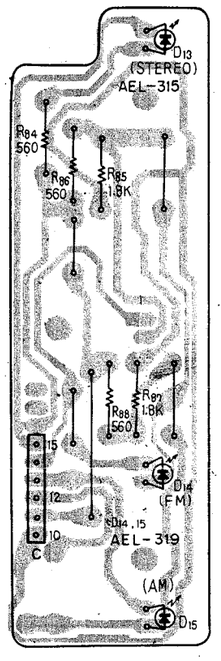

## FUSE Ass'y
## AWR-200

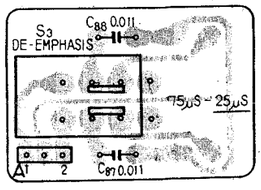



## SWITCH Ass'y
## GWS-187




## LED Ass'y GWX-308




## DE-EMPHASIS Ass'y
## GWS-188

# 10. SCHEMATIC DIAGRAM, P.C.BOARD PATTERNS AND PARTS LIST

## 10.1 MISCELLANEA

*NOTE:*

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

*Ex. 1* *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

| | | |
|---|---|---|
| 560Ω | $56 \times 10^1$ — 561 | RD¼PS 5 6 1 J |
| 47kΩ | $47 \times 10^3$ — 473 | RD¼PS 4 7 3 J |
| 0.5Ω | 0R5 | RN2H 0 R 5 K |
| 1Ω | 010 | RS1P 0 1 0 K |

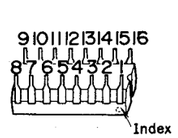
*Ex. 2* *When there are 3 effective digits (such as in high precision metal film resistors).*

| | | | |
|---|---|---|---|
| 5.62kΩ | $562 \times 10^1$ | 5621 | RN¼SR 5 6 2 1 F |

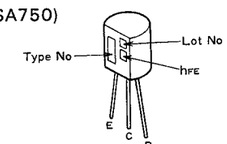
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

### External Appearance of Transistors and ICs

PA3001-A
PA1001-A
HA1138




(2SA750)

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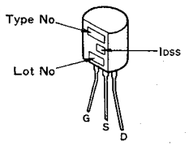
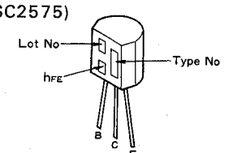



(2SC2575)

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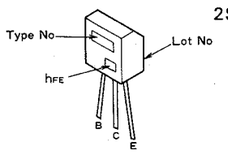
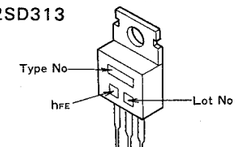
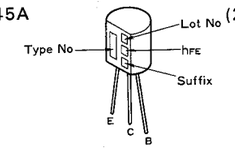
2SC461



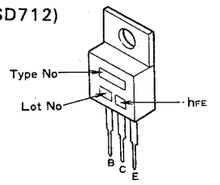

2SD313



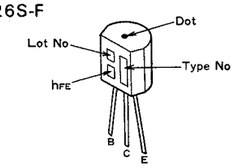

2SC945A




(2SD712)




2SA726S-F




### Miscellaneous Parts

#### LAMPS AND FUSE

| Part No. | Symbol & Description | |
|---|---|---|
| AEL-029 | PL1-PL3 | Lamp (wedge type) |
| ⚠ AEK-106 | FU1 | Fuse (1A) |

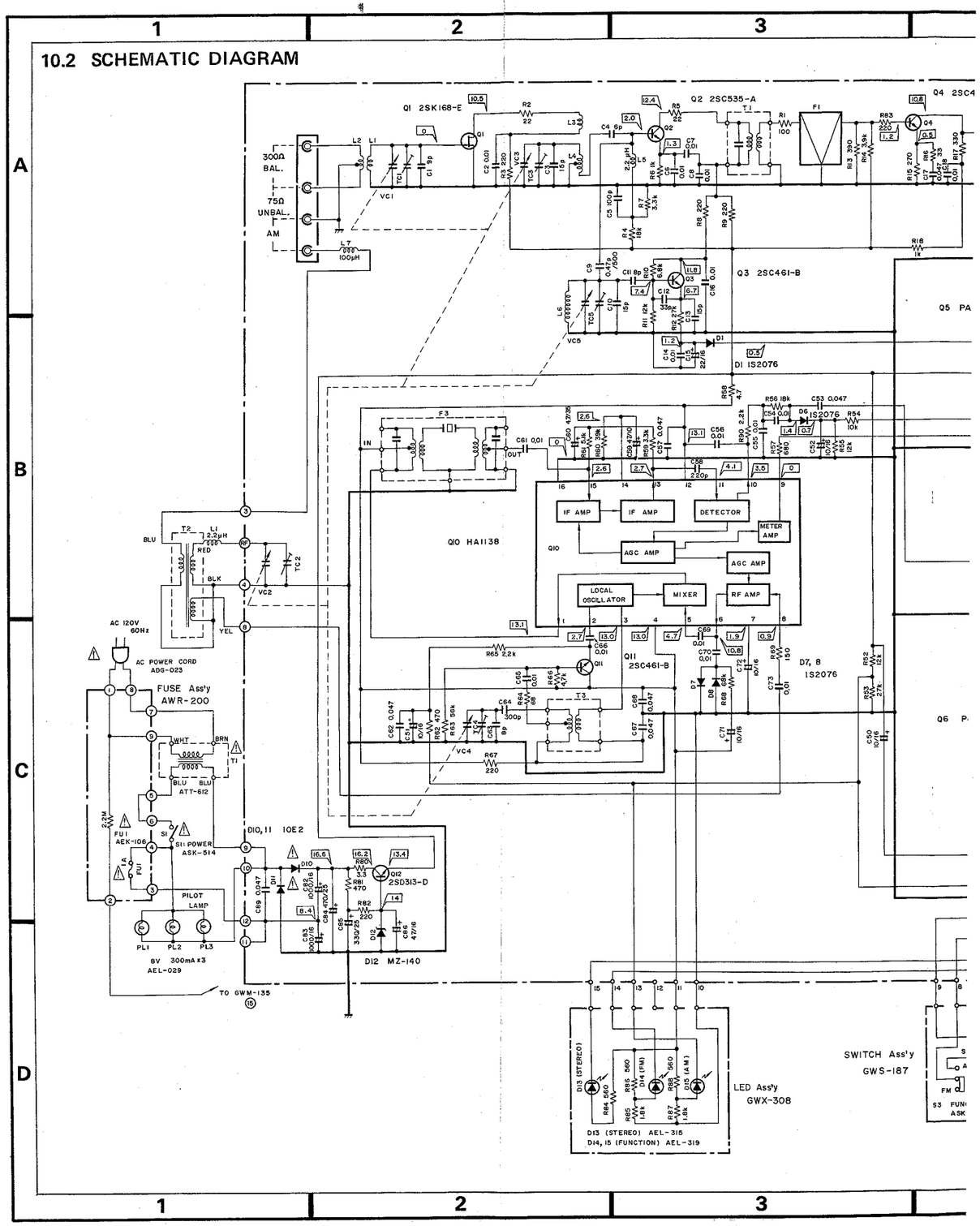
#### P.C. BOARD ASSEMBLIES

| Part No. | Description |
|---|---|
| GWM-135 | Tuner assembly |
| GWS-187 | Switch assembly |
| GWS-188 | De-emphasis assembly |
| GWX-308 | LED assembly |
| AWR-200 | Fuse assembly |

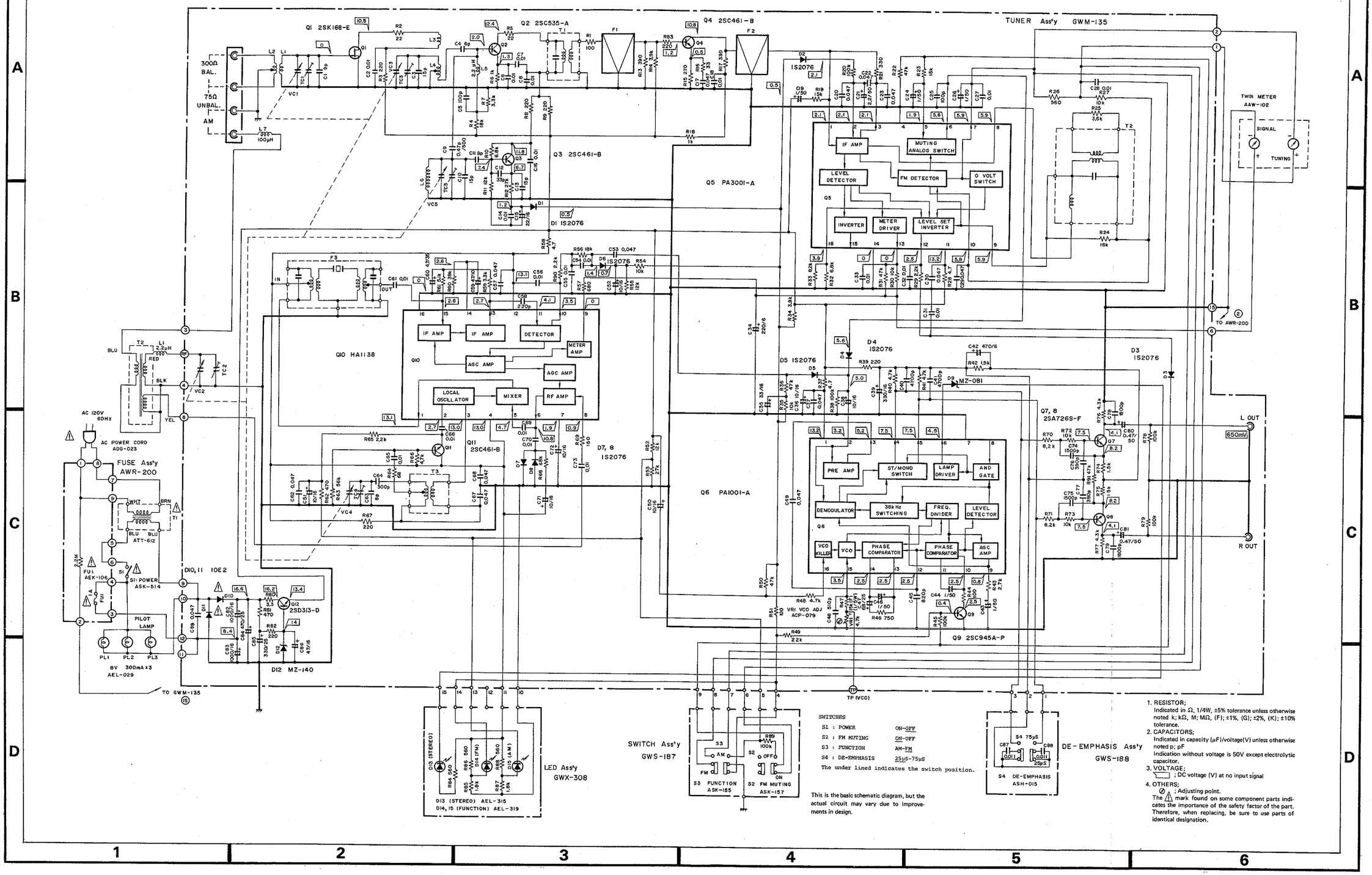
#### OTHERS

| Part No. | Symbol & Description | |
|---|---|---|
| ⚠ ATT-612 | T1 | Power transformer |
| ATB-505 | T2 | Bar-antenna |
| ⚠ ASK-514 | S1 | Lever switch (POWER) |
| AAW-102 | | Twin meter (SIGNAL/TUNING) |
| AKK-005 | | Lamp socket (wedge type) |
| ⚠ ADG-023 | | AC power cord |

## 10.2 SCHEMATIC DIAGRAM



## 10.2 SCHEMATIC DIAGRAM




SWITCHES

| | |
|---|---|
| S1 : POWER | ON-OFF |
| S2 : FM MUTING | ON-OFF |
| S3 : FUNCTION | AM-FM |
| S4 : DE-EMPHASIS | 25μS-75μS |

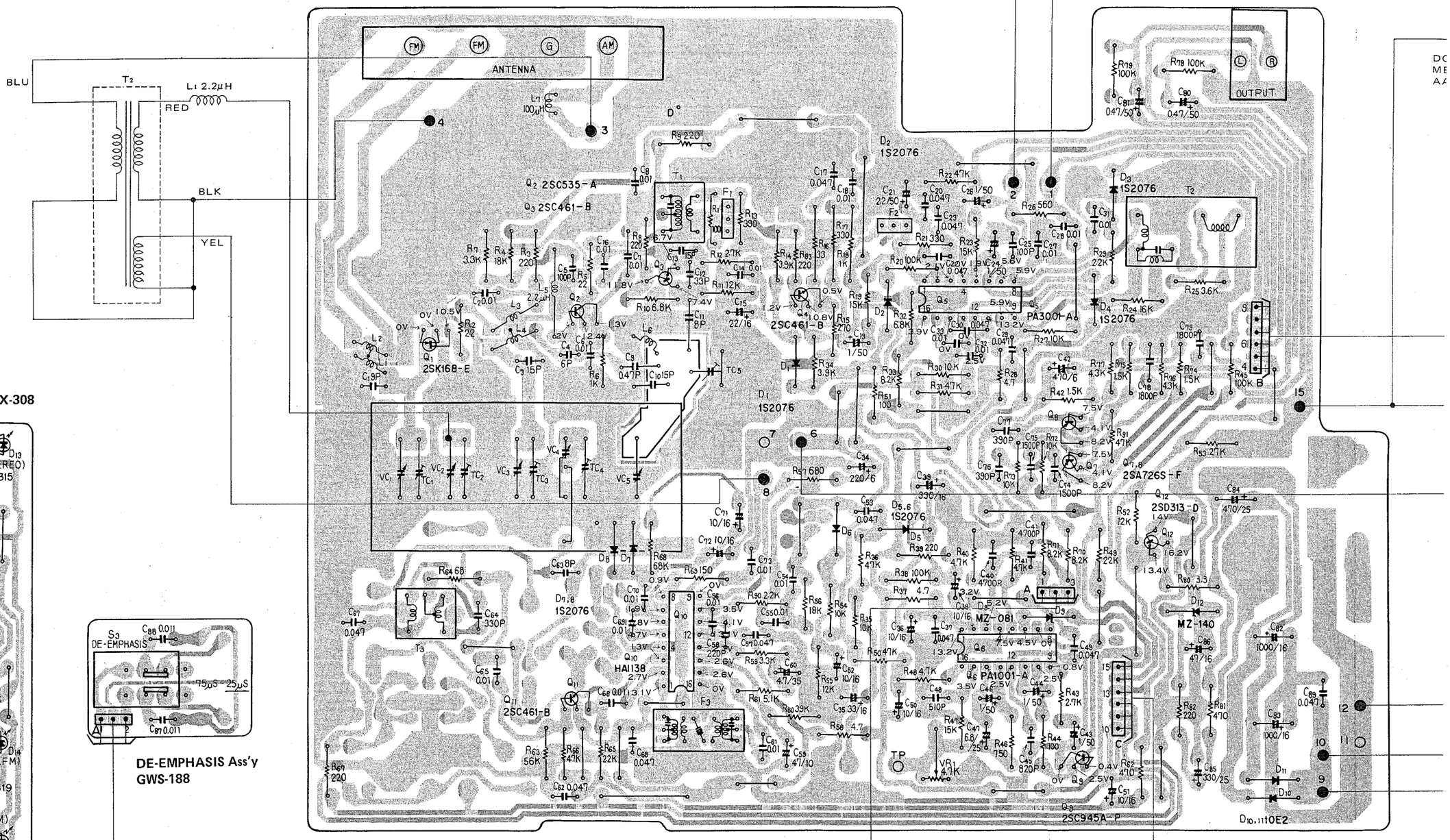
The under lined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

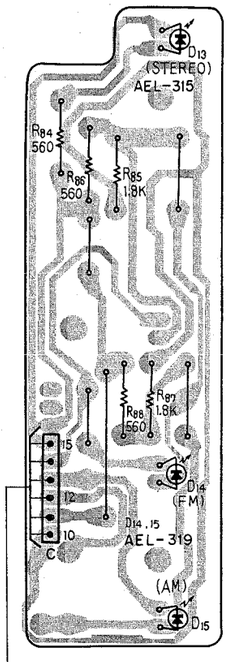
1. RESISTOR;
   Indicated in Ω, 1/4W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10% tolerance.
2. CAPACITORS;
   Indicated in capacity (μF)/voltage(V) unless otherwise noted p; pF
   Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE;
   ▭ ; DC voltage (V) at no input signal
4. OTHERS;
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

## 10.3 P.C. BOARDS CONNECTION DIAGRAM

TUNER Ass'y GWM-135



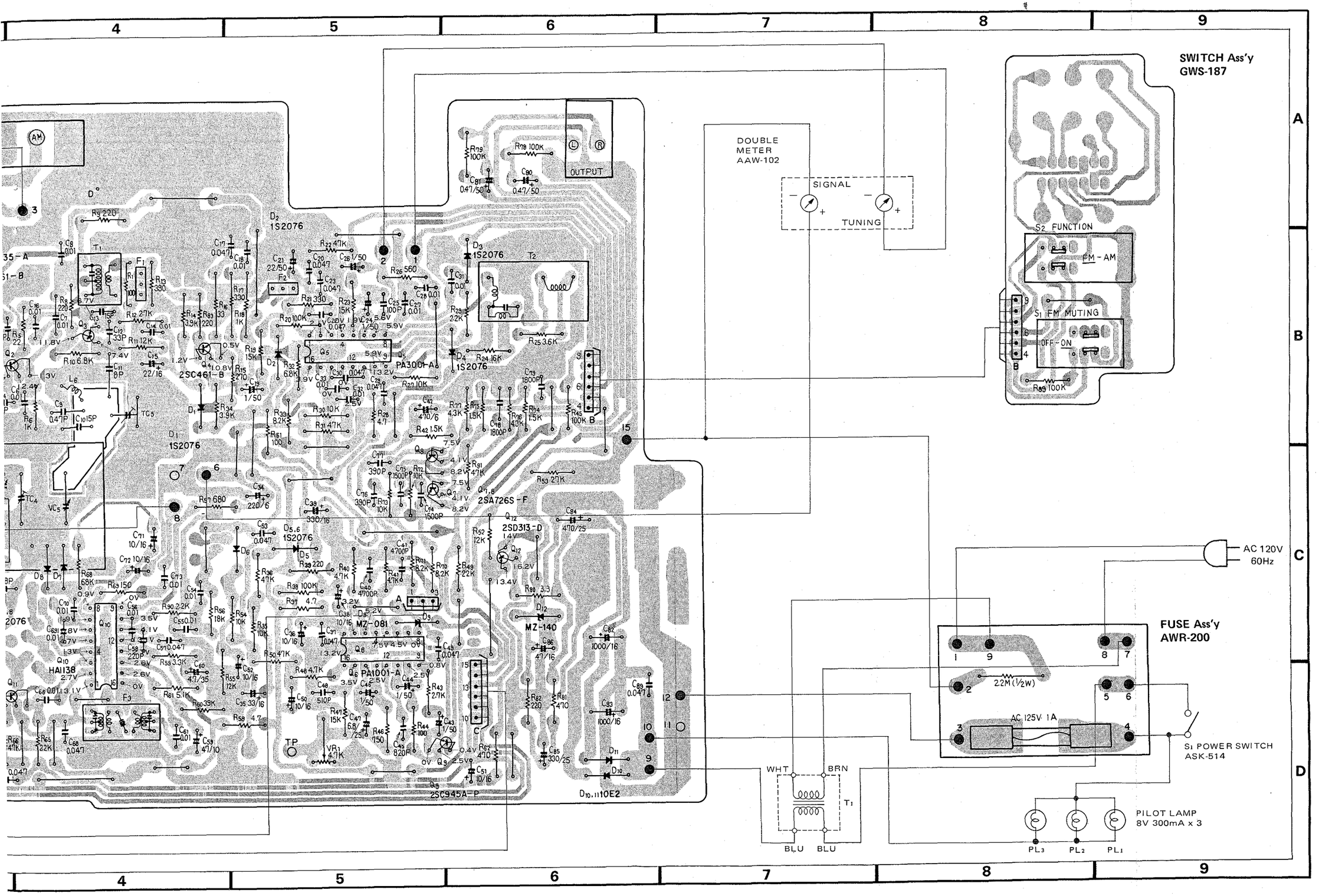

LED Ass'y GWX-308







DE-EMPHASIS Ass'y
GWS-188


SWITCH Ass'y
GWS-187
DOUBLE
METER
AAW-102
SIGNAL
TUNING
OUTPUT
S2 FUNCTION
FM - AM
S1 FM MUTING
OFF - ON
R99 100K
FUSE Ass'y
AWR-200
AC 120V
60Hz
AC 125V 1A
S1 POWER SWITCH
ASK-514
PILOT LAMP
8V 300mA x 3
PL3 PL2 PL1
WHT BRN
BLU BLU
T1
2.2M (½W)
D2 1S2076
D3 1S2076
D4 1S2076
D1 1S2076
D5.6 1S2076
D6
D7
D8
D9 MZ-081
D12 MZ-140
D10,11 10E2
Q1,8 2SA726S-F
Q12 2SD313-D
Q5 PA3001-A
Q6 PA1001-A
Q9 2SC945A-P
Q4 2SC461-B
Q10 HA1138
T1
T2
L6
F1
F2
F3
TC4
TC5
VC5
VR1 4.7K
TP
A
B
C
D
4
5
6
7
8
9

# SUPPLEMENTS FOR MODEL TX-608/KU

Model TX-608/KU is the same as Model TX-6800/KU with exception of descriptions in this supplements.

## Contrast of Miscellaneous Parts

| Symbol | Description | Part No. | | Remarks |
|---|---|---|---|---|
| | | TX-6800/KU | TX-608/KU | |
| | Front panel | ANB-721 | ANB-737 | |
| | Side panel L | AMS-033 | ..... | |
| | Side panel R | AMS-034 | ..... | |
| | Top panel | AMS-035 | ..... | |
| | Bonnet case | ..... | ANE-249 | |
| | Screw 4 x 25 | ABA-206 | ..... | for side panels |
| | Screw 4 x 6 | ..... | ABA-180 | for bonnet case |
| | Operating instructions | ARB-319 | ARB-335 | |
| | Packing case | AHD-694 | AHD-705 | |
| | Side pad | AHA-188 | AHA-189 | |

ADDITIONAL

# Service Manual

PIONEER

## AM/FM STEREO TUNER

# TX-608 HE HP

**The basic performance of Model TX-608 is the same as Model TX-6800. Model TX-6800 has wooden cover, while Model TX-608 employs metal. This additional service manual is applicable to the TX-608/HE and the TX-608/HP, please refer to the TX-6800/KU service manual (ART-375) with exception of this supplements.**

**Model TX-608/HE:** **For Europe Continent model**
**Model TX-608/HP:** **For Australia (Oceania) model**

### Specifications

The specifications for HE and HP types are the same as the TX-6800/KU except for following sections;

FM Section

Sensitivity (DIN)
- MONO ..... 1.5μV
- STEREO ..... 50μV

Signal-to-Noise Ratio (DIN)
- MONO ..... 76dB (unweighted)
- STEREO ..... 66dB (unweighted)

Miscellaneous

Power Requirement
- HE type ..... 220V, 50/60Hz
- HP type ..... 240V, 50/60Hz

Dimensions ..... 420(W)x150(H)x284(D)mm
16-9/16(W)x5-7/8(H)x11-3/16(D)in

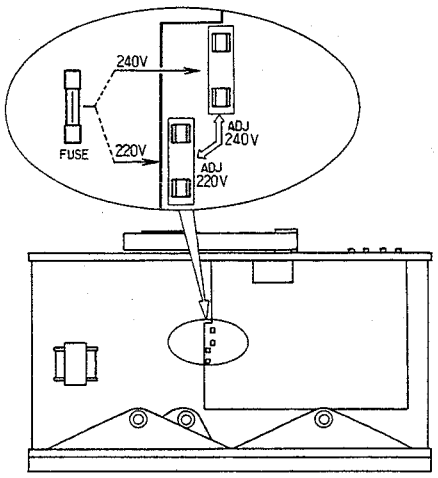
Weight (Without Package) ..... 5.1kg (11 lb 4 oz)

### Line Voltage Selection

Line voltage can be changed as follows:

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Take out the fuse from the P.C.board.
4. Re-install the fuse in the correct voltage indication.
5. Stick the line voltage label on the rear panel.

| Description | Part No. |
|---|---|
| 220V label | AAX-193 |
| 240V label | AAX-192 |




**PIONEER ELECTRONIC CORPORATION** 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
**U.S. PIONEER ELECTRONICS CORPORATION** 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
**PIONEER ELECTRONIC (EUROPE) N.V.** Luithagen-Haven 9, 2030 Antwerp, Belgium
**PIONEER ELECTRONICS AUSTRALIA PTY. LTD.** 178-184 Boundary Road, Braeside, Victoria 3195, Australia



<ART-377-0>

4948

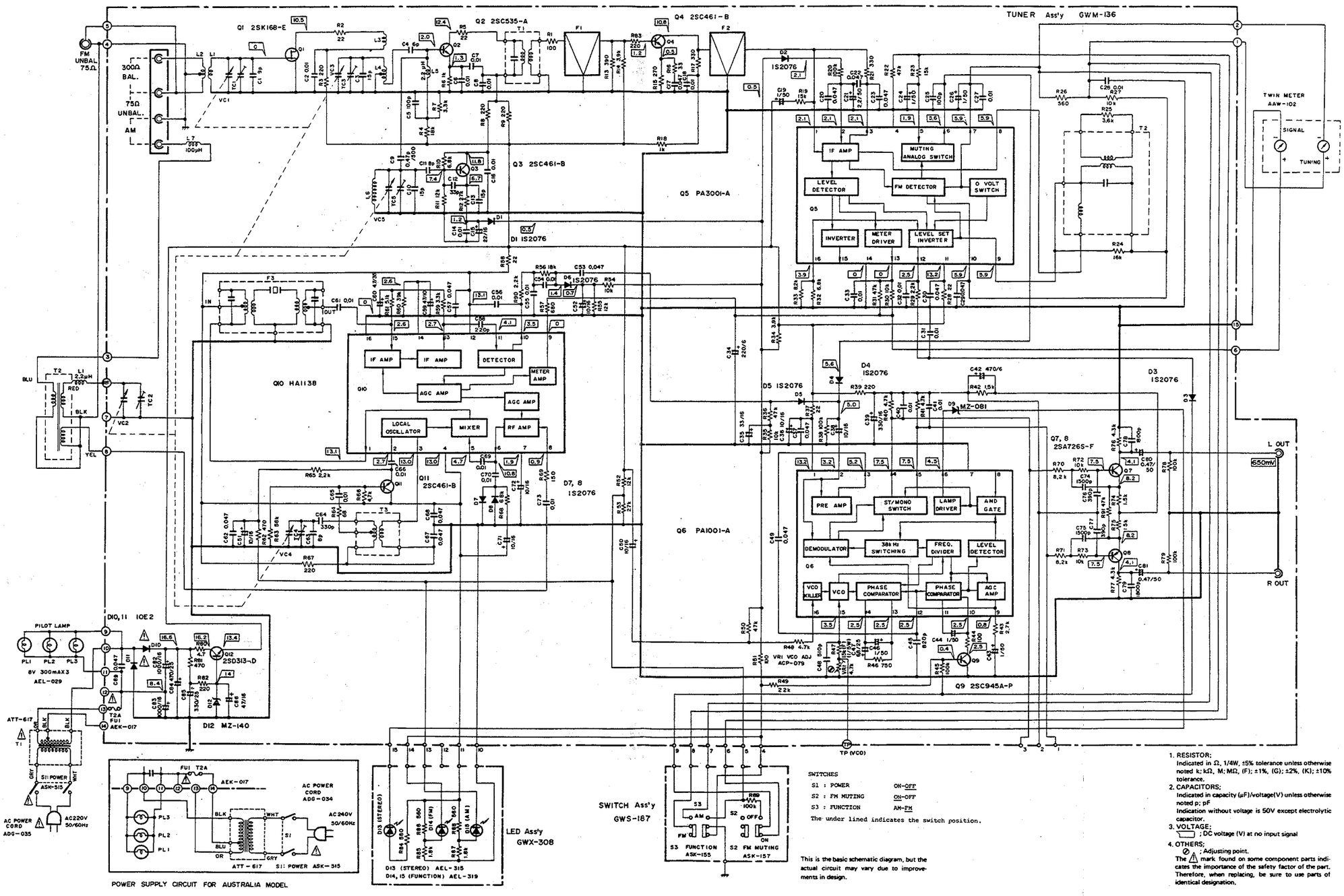
## CONTRAST OF MISCELLANEOUS PARTS

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

| Symbol | Description | Part No. | | | Remarks |
|---|---|---|---|---|---|
| | | TX-6800/KU | TX-608/HE | TX-608/HP | |
| ⚠ T1 | Power transformer | ATT-612 | ATT-617 | ATT-617 | |
| ⚠ S1 | Lever switch (POWER) | ASK-514 | ASK-515 | ASK-515 | |
| ⚠ FU1 | Fuse (1A) | AEK-106 | . . . . . | . . . . . | |
| | Fuse (2A) | . . . . . | AEK-017 | AEK-017 | |
| ⚠ | AC power cord | ADG-023 | ADG-035 | ADG-034 | |
| | Coaxial connector socket | . . . . . | AKP-016 | AKP-016 | |
| | P.C. board holder | AEC-554 | . . . . . | . . . . . | For fuse assembly |
| | Tuner assembly | GWM-135 | GWM-136 | GWM-136 | |
| | Switch assembly | GWS-187 | GWS-187 | GWS-187 | |
| | LED assembly | GWX-308 | GWX-308 | GWX-308 | |
| | Fuse assembly | AWR-200 | . . . . . | . . . . . | |
| | De-emphasis assembly | GWS-188 | . . . . . | . . . . . | |
| | Front panel | ANB-721 | ANB-737 | ANB-737 | |
| | Side panel L | AMS-033 | . . . . . | . . . . . | |
| | Side panel R | AMS-034 | . . . . . | . . . . . | |
| | Top panel | AMS-035 | . . . . . | . . . . . | |
| | Top cover | . . . . . | ANE-249 | ANE-249 | |
| | Screw 4x25 | ABA-206 | . . . . . | . . . . . | For side panels |
| | Screw 4x6 | . . . . . | ABA-180 | ABA-180 | For top cover |
| | Operating instructions | ARB-319 | ARB-327 | ARB-327 | English |
| | Operating instructions | . . . . . | ARD-136 | . . . . . | German/French |
| | Packing case | AHD-694 | AHD-705 | AHD-705 | |
| | Side pad | AHA-188 | AHA-189 | AHA-189 | |

## SCHEMATIC DIAGRAM

*NOTE:*
*The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.*




SWITCHES

| | | |
|---|---|---|
| S1 : POWER | ON-OFF |
| S2 : FM MUTING | ON-OFF |
| S3 : FUNCTION | AM-FM |

The under lined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

1. RESISTOR;
Indicated in Ω, 1/4W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10% tolerance.
2. CAPACITORS;
Indicated in capacity (μF)/voltage(V) unless otherwise noted p; pF
Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE;
; DC voltage (V) at no input signal
4. OTHERS;
; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

## TUNER ASSEMBLY (GWM-136)

The parts of tuner assembly (GWM-136) are the same as GWM-135 (for KU type) except for following sections;

| Part No. | Symbol & Description | |
|---|---|---|
| ATF-075 | F3 | AM ceramic filter (468kHz) |
| CQMA 103J 50 | C40, C41 | Mylar capacitor |
| RD¼PSF 4R7J | R80 | Carbon film resistor |
| RD¼PSF 220J | R28, R37, R58 | Carbon film resistor |